

WORLD'S BEST WALL DIVING P.50

RODALE'S

SCUBA DIVING

THE MAGAZINE DIVERS TRUST

10 Biggest Sites in the BAY ISLANDS

Big sharks,
big wrecks
and big reefs
in Honduras

11 BCs TESTED

ScubaLab finds the
right weight-integrated
model for you

HOW TO BE A HERO

Take a rescue course and
save the day

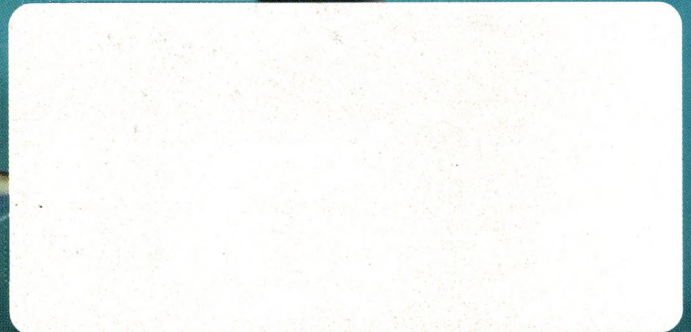
CALIFORNIA BY SHORE

Hit the beach and walk into
So Cal's best dive sites

HANGING WITH MERMAIDS

Our writer grows a tail and finds
the fountain of youth

HAPPY CAMPER:
Get mask-to-bottlenose with
dolphins in Roatan and see
whose smile is bigger. P. 34





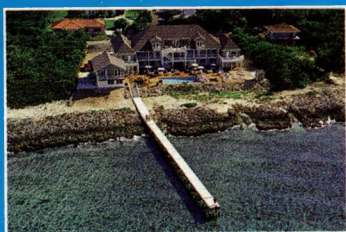
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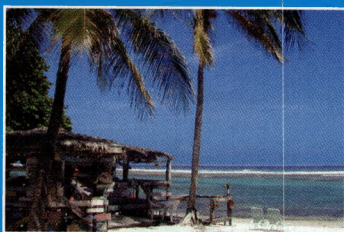


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RODALE'S
SCUBA
DIVING

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Mermaids fight to save Weeki Wachee Springs, the Florida roadside attraction that holds the key to eternal girlhood.



54 Fountain of Youth With the future of Florida's Weeki Wachee Springs hanging in the balance, a school of aging mermaids rallies to try to save the park and a piece of their own glittery youth. *By Vicki Glembocki*

DIVE LOG

60 Raja Ampat Islands, Indonesia

In an area of the Pacific known as the heart of the world's marine biodiversity, one island group stands out for its jaw-dropping abundance of life. *By Burt Jones and Maurine Shimlock*

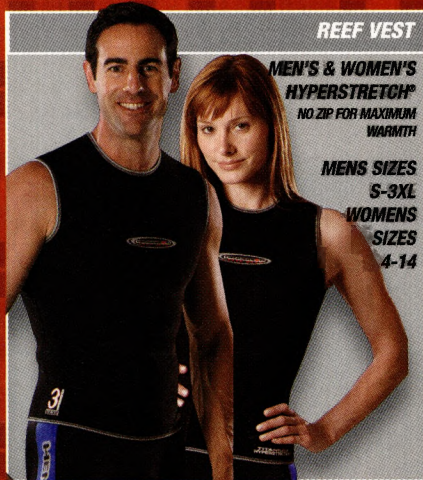
66 Weight-Integrated BCs The ScubaLab test team pushes the inflator buttons, pulls the dump valves and ditches the integrated weights of 11 new models to find the best ways to combine your weight belt with your BC. *By John Brumm*

LESSONS FOR LIFE

74 Speed Kills In his haste to be the first diver on a wreck, an experienced technical diver makes a rookie mistake that ends his diving career forever. *By Michael Ange*

Cover photo by Stephen Frink.





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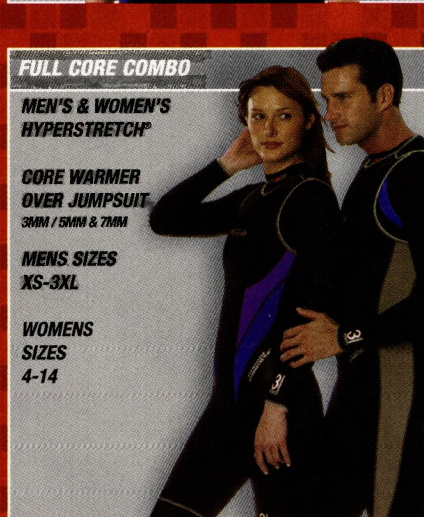


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RODALE'S SCUBA DIVING

THE GREAT DIVES

17 IN OUR MONTHLY round-up of secret spots and must-dive classics, we visit a Technicolor natural arch in the Maldives, silver sentries at a Grand Cayman classic and dwarf minke whales in the northern Great Barrier Reef.

CURRENTS

22 IT'S A CORAL! In an effort to preserve the genetic diversity of reef-building corals, one Florida scientist becomes a doting father. **Plus:** A jump into the blue in the Bahamas, a census of marine life and a different kind of seafood chef.

TRAINING

79 CONFIDENCE COURSE In Rescue Diver training, our writer learns to save a diver in distress, and manages to save his pride in the process.

84 FIVE THINGS YOU CAN LEARN FROM TECH DIVERS You can make longer, deeper and safer dives by borrowing techniques from scuba's cutting edge.

88 VISIBILITY: 20/20 If less-than-perfect vision is detracting from your enjoyment of diving, it's also compromising your safety. The latest vision-correction procedures can give you a whole new view of your favorite sport.

91 GOING DIGITAL If you think you're finally ready to switch from film to pixels, answer a few simple questions to get yourself headed in the right direction.



When you think of the Bay Islands of Honduras, think big.



34 BIG TIME IN THE BAY ISLANDS Ten dives that prove good things come in big packages.

41 DRIVE & DIVE A sampler of So Cal beach dives, where the crowds and cars end at the waterline.

50 WORLD'S BEST WALL DIVING Our readers name the 10 top destinations in the world for vertical diving.

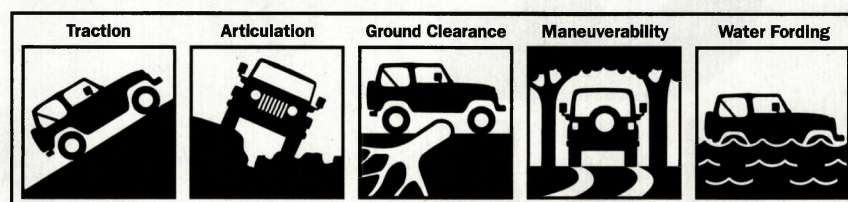
11 TALK 47 DIVE DEALS 99 IN DEPTH 104 LOOK

STEPHEN FRINK

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Photo taken from NATC testing.



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(EDITOR'S NOTE)

Sucker Hole

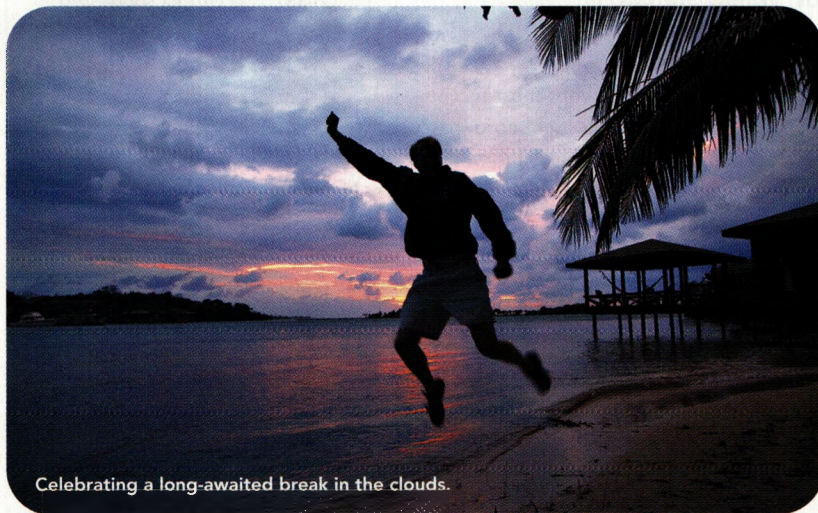
There's more than one way to have a perfect dive vacation.

LATE ON A MONDAY AFTERNOON, we flew into Roatan through a dense layer of dark gray clouds. It was an ominous start to what was supposed to be a week of diving, and the next six days gave us more of the same: rain, clouds, rain, wind and more rain. We spent our mornings in the water and then bounced back to the dock over rough seas. When the rain fell harder in the afternoons, we retreated to the card table or the covered hammock to catch up on some reading.

Among my traveling companions were a photographer and a skydiver whose separate fields share a term for a break in the clouds big enough to get your hopes up, but fleeting enough to dash them all over again: "sucker hole." We were clearly the suckers here. When the rain would stop long enough for us to see the clouds, they would shift aside only to reveal another darker layer behind them.

But with the week's weather pattern established early on, we settled into a comfortable routine—eat, dive, eat, read, eat, play cards, sleep—that I finally decided I could manage for the rest of my life. Who needs the sun when you've got a sturdy dive boat, a deck of cards and a good book?

Then, on the day before we were scheduled to fly home, I found photographer Stephen Frink on the beach with three cameras, shooting an orange and pink sunset between the clouds. I knew this meant that the weather was going to clear for the divers who had just arrived for their week of vacation. And I knew that clear skies would keep them on the dive boats. They'd have calm seas and perfect vis. They wouldn't take naps. They wouldn't finish the books they brought to read. They wouldn't learn a single new card game. Suckers. —BUCK BUTLER



Celebrating a long-awaited break in the clouds.



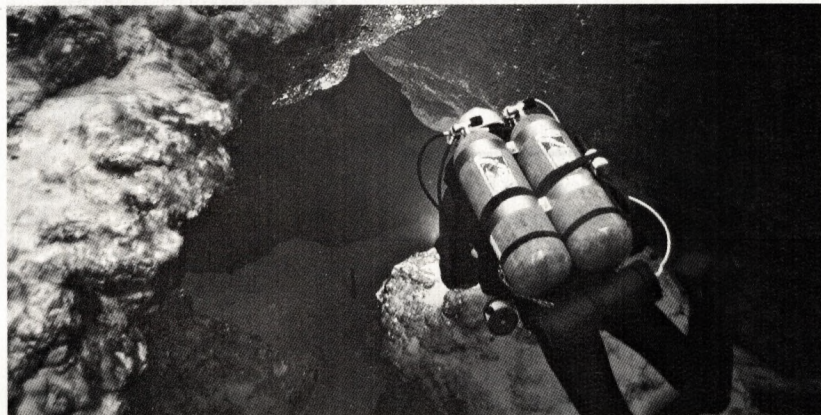
(CONTRIBUTOR)

VICKI GLEMBOCKI

We became aware of the unique talents of Vicki Glembocki, articles editor at *Philadelphia Magazine*, when she took it all off (OK, she took most of it off) for a feature story on what it's like to be an exotic dancer. We were looking for somebody who could strap on a tail and plunge into the unusual world of the performing mermaids at Florida's Weeki Wachee Springs, and Vicki was happy to oblige (see "Fountain of Youth," p. 54). "Mermaids and strippers have a lot in common. They're all trying to get in touch with something inside, whether it's youth or sexiness or confidence ... and isn't that what we're all trying to do?" Vicki says. "The difference is, while they're doing it, mermaids and strippers get to wear the coolest bras."



(LETTERS)



Selfless Diving

I READ YOUR most recent "Lessons for Life" (Jan./Feb. '04) with my usual interest. Your technical analyses are right on target, and I always come away with a tidbit of new knowledge. Perhaps by its nature, scuba diving is an egocentric sport—depending on our individual skills, health, etc. When it becomes necessary to make a decision—whether to ignore the rule of thirds or perhaps to just say "no" and scrub a dive—your suggestion that consideration be given to nondivers (i.e., family and loved ones) is excellent. Please be assured that from now on all my pre-dive plans will include a review of the potential outcome of my behavior on those who love me or are dependent upon my continued existence. Keep up the good work. **George Edwards, Willow Springs, Ill.**

(HOW TO REACH US)

We want to know what's on your mind. Here are three easy ways to tell us:

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MAIL: Editor, Rodale's Scuba Diving, 6600 Abercorn St., Suite 208, Savannah, GA 31405

Where Is Scubapro?

I'VE NOTICED in your most recent reviews of gear that Scubapro has declined to participate. Why would they choose to do so? **John Walsh, Holmes, N.Y.**

We're disappointed, too, that Scubapro has repeatedly declined to submit gear for recent ScubaLab tests, including the review of weight-integrated BCs starting on page 66. We can't speak for Scubapro, but we can tell you that ScubaLab prides itself on conducting rigorous, objective testing, and we will continue to help readers be informed consumers of dive gear. When a manufacturer declines to submit gear, we consider whether to purchase the gear for testing. Since Scubapro pulled out, we haven't tested a major gear category where the company had entirely new products that we felt warranted purchasing. We do, however, think it's only fair to our readers to note in the reviews which major manufacturers have declined to participate.

(ONLINE)

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(CORRECTION)

Price Check

The ScubaLab review of alternate inflation regulators ("Better Alternatives," Jan./Feb. '04) contained an incorrect price for the stainless steel Atomic Aquatics SS1. The correct suggested retail price is **\$229**.

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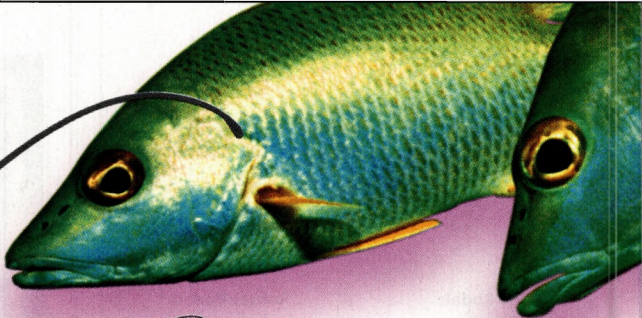
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Dive THE GREAT S

DIVE OF THE MONTH

KUDA BOLI, MALDIVES. The main attraction at this site off Felidhoo Atoll in the central Maldives is a sweeping natural arch overgrown with Technicolor hard and soft corals. Maximum depth here is 50 feet, so the paint-splatter of colors is often well lit by the sun, but to bring out the real brilliance, carry a dive light and prepare to be wowed.

Kuda Boli features a naturally garish color palette no self-respecting interior designer would ever try to duplicate.

PHOTOGRAPH BY **STUART WESTMORLAND**

MARCH 2004 SCUBADIVING.COM 17

A large underwater photograph serves as the background for the page. It depicts a school of tarpon swimming in clear blue water. In the lower right, a diver in a purple wetsuit and yellow fins is visible, swimming towards the fish. The scene is set near a coral reef structure.

(CAYMAN ISLANDS)

Bonnie's Arch

BIG TARPON MAY NOT BE the first thing you think of at the mention of Bonnie's Arch, but the natural coral span has been a hangout for the silvery fish for years. The tarpon you find here are more skittish than their kin at the famed North Wall site Tarpon Alley and usually bolt when divers approach. But with a stealthy approach and careful control of exhaust bubbles, you can watch the gamefish in action. Bonnie's Arch is shore-accessible off the West End of Grand Cayman, 50 to 70 feet deep, and completely encrusted with coral. Mammoth barrel sponges stretch eight feet in diameter alongside coral gardens, basket sponges and sprawling gorgonians. Along with the tarpon, which can grow up to eight feet long, Bonnie's Arch is also inhabited by hogfish, trumpetfish, French angels, grunts and blue tangs.



Resident tarpon add shimmering visual accents to one of Grand Cayman's most scenic sites.

If you're lucky enough to get in the water with a dwarf minke, listen for the grunts, moans and belches typical of the world's second-smallest baleen whale.



(AUSTRALIA)

Northern Great Barrier Reef

DWARF MINKE WHALES, *Balaenoptera acutorostrata*, may be pip-squeaks in the whale world, but at 20 feet long, they easily outsize divers. Along the northern sections of Australia's Great Barrier Reef, dwarf minkes often take the initiative to approach vessels and divers, curiously circling in deft, swift movements with an occasional surface-breaking spyhop. For positive ID, look for the white patches at the base of the whale's shoulders and onto its powerful pectoral fins. Dwarf minkes appear along the northern Great Barrier Reef during late June and early July, usually in open water several miles from the reef. These toothless wonders feast on fish and krill, and are typically spotted alone or in pairs.

SD

GET THERE



For more information on these Great Dives, turn to In Depth, page 99, section 1.

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Curre



The corals at Mote Marine Lab's tropical research center are thriving, thanks to Dave Lackland's blue thumb.

n t s



(BIOLOGY)

It's a Coral!**Meet the proud papa.**

Like any new father, David Lackland is exhausted. But unlike most new fathers, Lackland has hundreds of hungry mouths to feed. Using a blender, Lackland purees a combination of zooplankton, krill and frozen brine shrimp into a thick, pink paste to feed the tiny corals he's trying to raise. "It's where science ends and the techniques of creative cooking begin. It's like Emeril," Lackland says.

Lackland spends two hours hand-feeding the corals, squirting a syringe filled with his concoction near the extended polyps of the more than 20 species of corals he's growing. The feeding is just one part of Lackland's tireless effort to preserve the genetic diversity of reef-building corals.

Using coral broken off the reef after ship groundings, Lackland has created a coral genetics bank at Mote Marine Laboratory's tropical research center in Summerland Key, Fla. Under his care, the fragments will grow into healthy corals that someday could be used to replenish troubled reefs.

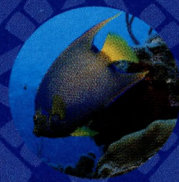
Lackland feeds the corals every other day, beginning late in the afternoon. His parental doting has paid off, and his corals are thriving, unhampered by the predators, water conditions, grounded vessels and even snorkelers that cause damage to corals in the wild. "In the lab, I can create perfect conditions," he says. "I have a blue thumb."

With coral reefs worldwide under intense pressure from a variety of threats, most researchers are studying why corals are dying or are propagating corals in the wild. Lackland's goal is different, however. "It's like the hurricane is coming, and I'm saying, 'We've got to get the lawn furniture inside.' I'm a little panicked."

For more information, visit www.mote.org.

PHOTOGRAPH BY ROB O'NEAL

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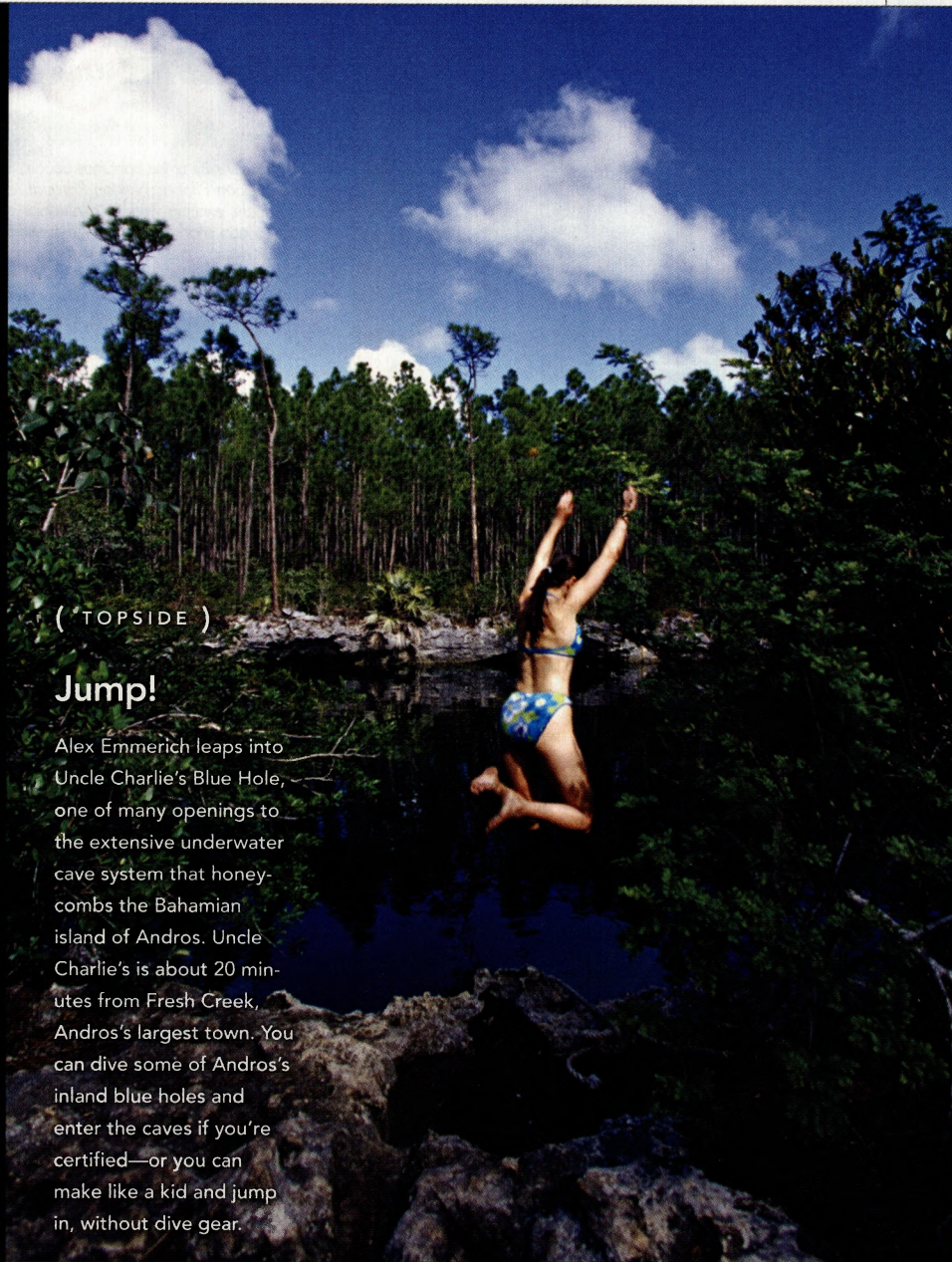
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(TOPSIDE)

Jump!

Alex Emmerich leaps into Uncle Charlie's Blue Hole, one of many openings to the extensive underwater cave system that honeycombs the Bahamian island of Andros. Uncle Charlie's is about 20 minutes from Fresh Creek, Andros's largest town. You can dive some of Andros's inland blue holes and enter the caves if you're certified—or you can make like a kid and jump in, without dive gear.

(BUZZ)

Give That Diver a Cigar

With bipartisan support growing in Congress to end the 41-year-old ban on travel to Cuba, travel industry experts predict that customs hassles and permits required to visit the Caribbean's largest island will ease, perhaps as early as 2005. Expect U.S. divers to light a celebratory cigar when the ban is lifted: Cuba has 3,563 miles of coastline lined by scores of dive sites.

(QUOTE)

It's good to live next to a firefighter.
Especially a scuba-diving firefighter.

—LOIS NIESEN, AFTER FIREFIGHTER LT. ED THOMPSON DONNED SCUBA MASK AND NITROX TANK TO PUT OUT A FIRE IN NIESEN'S BOCA RATON, FLA., HOME.



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(JOBS)

CHEF TO THE FISHES

Cooking seafood for sea creatures.

He's not a chef to the stars, he doesn't have his own T.V. show and he's never published a cookbook, but to the 50,000 creatures living in Atlantis Resort's aquarium tanks, Michael Donaldson (pictured above) is a celebrity. That's because every morning, Donaldson prepares the 900 pounds of fresh seafood they scarf down daily.

The resort, located on Paradise Island off Nassau, Bahamas, spends nearly a half million dollars each year on food for the creatures in the 11 tanks and exhibits of its aquarium. It takes Donaldson several hours to cut, mix and prepare the day's menu, including mackerel, shrimp, sardines and minnows. One of Donaldson's specialties is a tasty treat for the baby rays. "We make shrimp soup. They love it."

The dozen or so different species of sharks living in the aquarium are picky eaters. "The sharks won't eat fish heads, so we prepare the food for them without them," Donaldson says. "If we didn't, we'd find fish heads floating in the aquarium."

—SCOTT D. JONES

(AQUARIUM)

Life Inside the Fishbowl

Giant-stride into the New England Aquarium's Giant Ocean Tank.

New England's most unique dive is a strangely lit place, inhabited by sand tiger sharks, tarpon, sea turtles, barracuda, stingrays and moray eels. There's no surge, no surf, and the entry couldn't be easier. Just jump in.

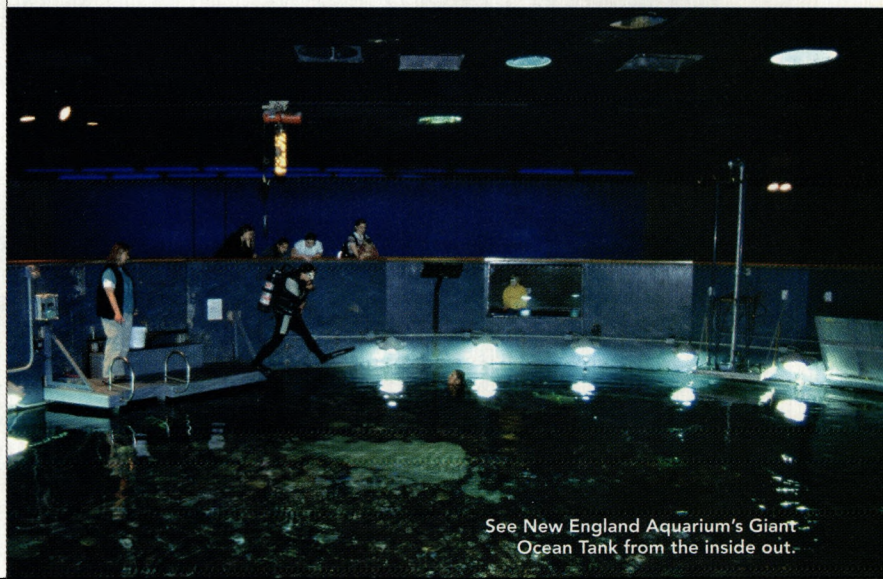
Since the New England Aquarium first opened in Boston in 1969, the Giant Ocean Tank (GOT) has been its main attraction. Twenty-four feet deep and filled with more than 125 different species of sea life, the 200,000-gallon tank spirals down through the center of the building, seemingly anchored by a massive faux coral reef.

You have to jump through a few hoops to dive the GOT. Join the aquarium's dive club and you're eligible to participate in the monthly raffles held to give away GOT dives.

Another option is to bid on one of the GOT dives the aquarium donates to charity auctions. Expect to bid at least \$300 to win.

Or, you can dive it the old-fashioned way, by joining the aquarium's team of volunteer divers, whose main function is the endless cleaning of the tank. "Think of all the things you have to do to keep an aquarium in your house clean," says Holly Martel Bourbon, the aquarium's diving safety officer. "We have to do all the same things, but from the inside." —JERRY SHINE

For more information, check the aquarium's web site at www.neaq.org.



See New England Aquarium's Giant Ocean Tank from the inside out.

(RESEARCH)

SEARCHING FOR SIGNS OF LIFE

In the 10-year, worldwide Census of Marine Life, every little creature counts.

It is the most massive marine survey ever undertaken. Already, it holds information on more than 15,300 species of marine fish, and the final count may include 210,000 forms of marine life—or more. The purpose of the Census of Marine Life (CoML, www.coml.org) is multifaceted: to identify threatened species and important breeding areas; to develop new pharmaceutical and industrial compounds; and to locate and protect oceanic areas where vast numbers of marine life coexist. CoML is collecting this detailed information to create a “road map” of the world’s oceans.

For example, scientist Dann Blackwood contributed information pertaining to the abundance of daisy brittle stars in fished and unfished areas on Georges Bank near Woods Hole, Mass., to the CoML. In 1994, Blackwood and fellow researchers aboard the vessel *Delaware II* used a net attached to a metal frame to dredge the ocean floor, and found that brittle stars were thriving in areas not frequently fished. Blackwood’s efforts might have been lost to the scrap heap of interesting but arcane scientific records, inaccessible to other scientists working in the field, if not for the CoML.

Surveying the contents of the world’s oceans is not a task for the weak at heart, and the CoML, a joint project of international governments, private foundations and corporations, allotted 10 years and \$1 billion to complete the task. More than 300 scientists from 53 countries currently work for the CoML, and the formal census will be made available in 2010. —GINA MARSHALL



Blackwood's daisy brittle star.

DANN BLACKWOOD



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(ENVIRONMENT)

Buddy Diving

Making a difference on Earth Day.

Nancy Stryble of Oakland, Calif., wants to fund a mooring buoy project in the Namena, Fiji, marine park, with a little help from her friends. Stryble is donating \$1,000 to the project, and she's asked her dive buddies to match her donation.

Stryble is part of the Coral Park Buddy program, in which businesses, youth groups, aquariums, dive clubs and individual divers are hoping to raise \$35,000 by April 22 to fund grassroots conservation projects at six marine protected areas in Belize, Bonaire, Fiji, Cozumel, Palau and the Philip-

pinas. The campaign, which was developed by the Coral Reef Alliance as part of its Dive In To Earth Day event, is encouraging divers to be creative in their fundraising efforts.

"Too often [marine parks] lack the resources necessary to protect coral reefs," says Brian Huse, executive director of Coral Reef Alliance. "The good news is that a little money goes a long way in these small communities."

To find out more about becoming a park buddy, go to www.coral.org/divein.

(STAT)

687

Number of marine life species found by scientists in the Florida Straits. This is more than has been documented in any other area in the Atlantic Ocean, including the Caribbean Sea, according to a study by the Center for Applied Biodiversity Science. The most diverse area is about 10 miles east of Miami. Blind skates, dwarf sharks and Atlantic saw sharks were among the species found.

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"Second to None" *Sport Diver* magazine
August, 2003

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"Better Alternatives" *Rodale's Scuba Diving* magazine
Scubalab, Jan/Feb 2004

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L I F E



(FISH ID)

What's This?

This tiny, two-inch fish drifts above Caribbean reefs, its tail cocked and ready to attack its prey with the lightning-quick speed of the fired missile that is its namesake. A rare find for even observant fish-watchers, it looks like a skinny, reddish, J-shaped stick floating in the water. Because this fish generally ignores divers, you might get close enough to see its long snout, the light yellow line on its head and the black blotches on its dorsal and anal fins. What you won't see if you blink is the sudden spring of this creature as it surprises its prey.

t h e A N S W E R

ARROW BLENNY, *Lucayablennius zingaro*.



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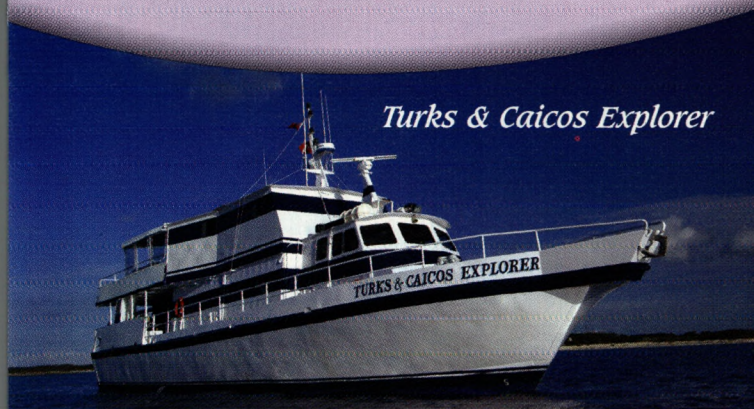


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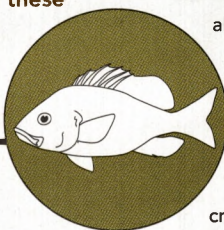
Turks & Caicos Explorer



Caribbean Explorer II

the DIFFERENCE

There's a good reason that hamlets and damsels look alike. But with these tips, you'll have no problem telling them apart.



At first glance, the small members of the sea bass family known as hamlets more closely resemble damselfishes than their much larger and heavier-bodied relatives, the groupers. And there might be a reason for the ham-

lets' cunning charade: Many marine biologists believe that the little carnivores mimic algae-eating damselfishes and other nonpredatory fishes to gain an advantage when stalking shrimp, crabs and tiny fish. Although the hamlets' ruse might fool unsuspecting prey, a sharp-eyed fish-watcher should have little problem differentiating between damsels and hamlets. First, hamlets have

BLACK HAMLET



flattened heads, in contrast to the damselfishes' rounded napes. There are also distinct behavioral differences—hamlets

swim about the bottom with the slow, deliberate manner of hunters, whereas most damselfishes dart about with end-

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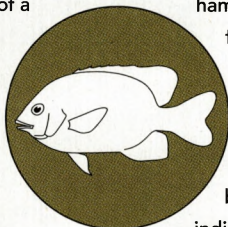


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less energy as they busily tend and patrol private algae gardens that they defend pugnaciously from intruders. In fact, even divers are not immune to the aggressive assaults of these feisty fishes. If you linger too long near the domain of a dusky, longfin or three-spot damselfish, expect to receive a sharp nip or two on exposed skin. Fortunately, their tiny mouths lined with fine teeth are designed for harvesting algae, and even their worst bites fail to leave a mark.

Hamlets, all members of genus *Hypoplectrus*, are confined to the waters of the trop-



ical western Atlantic, where they are believed to have evolved after the closing of the isthmus of Panama following the last ice age. Within the scientific community, there is a long-running debate whether

hamlets are actually different species or simply a single species displaying different color and marking patterns. Aquarium-based observations indicate hamlets with

like colors and markings nearly always spawn together as mated pairs. On rare occasions, however, different appearing individuals will spawn, producing hybrids, which make up

DUSKY DAMSELFISH



three percent of the hamlet population. Based on these observations and DNA analysis, the American Fisheries Society

now recognizes 11 different hamlets to be distinct species. —NED DELOACH AND PAUL HUMANN

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Travel

These ten dives prove that good things can come in big packages.

BY BUCK BUTLER

AFTER SEVEN straight days of nearly constant sea-churning storms, there was enough sand suspended in the water over the wreck of the *Odyssey* to form a good-sized beach. I ducked my head under a passing wave, looking for the ship that was supposed to be directly underneath me and found nothing but a thick haze.

DIVE GUIDE

Big Time in the Bay Islands



Get ready to play: Two dolphins from the Roatan Institute for Marine Sciences will swim out to meet you for a romp on the sand flat just off the north shore of Roatan.

When I did make my way to the bow of the freighter, I found the length of the 300-foot ship extending beyond the limited visibility. I kicked over the bow and followed the starboard side rail toward the stern, slowly kicking over the cargo hold, which yawned open underneath me like a rectangular canyon, deep and wide. "Wow," I thought. "That is *big*."

Not the most profound insight, I realize, but one that's likely to occur repeatedly to anyone diving the Bay Islands of Honduras. It's all huge here: the whale sharks of Utila, the crack in the reef at Mary's Place on Roatan, Guanaja's *Jado Trader*, the reef sharks at Roatan's Cara a Cara Point.

The Bay Islands have long been noted for the great variety of dive experiences they offer. They've got wrecks, walls, reefs and animal encounters. But when a destination touts its variety, it's sometimes because it doesn't have a signature attraction, the singular reason a diver might use a week of hard-earned vacation time to spend it there. If you're looking for that special something in the Bay Islands, it helps to think differently. In fact, think big.

BIG ANIMALS

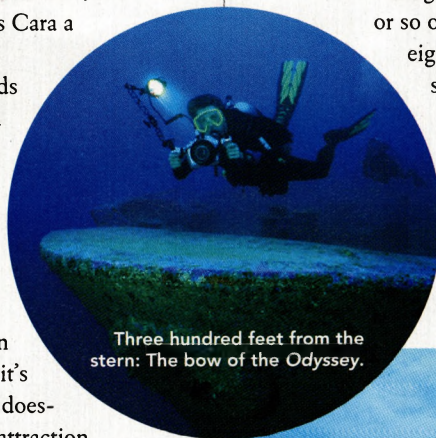
ROATAN: Sharks

The vast majority of reefline around Roatan lies close offshore and follows the contours of the island's coastline. Cara a Cara Point, however, juts out at a right angle from the south shore like a long handle to the island. Cara a Cara means "face to face," and at the tip of the point, the reef lies face-to-face with the vast depth of the channel that separates Roatan from mainland Honduras. Thanks to this proximity to deep water, the point is a favorite hangout of Caribbean

reef sharks, and is now the site of the island's first shark encounter.

For the most part, the dive drill is standard Caribbean-shark-encounter: Descend on a mooring line to a sand flat at 70 feet and kneel there while eight to 20 sharks are joined by opportunistic feeders including Nassau groupers and horse-eye jacks circling the bait bucket. There are a couple of elements, however, that set this shark dive apart. One is the setting: The feeding area is surrounded by a thriving reef that rises from the sand to create picturesque shark-photo backdrops. The other is the unorthodox feeding drill: After 30 minutes

or so of watching the four- to eight-foot sharks patiently swim around the bait bucket, the divemaster pops the lid off the bucket and heaves it onto the sand. The sharks attack quickly, making short work of the



Three hundred feet from the stern: The bow of the *Odyssey*.



Healthy reefs and plentiful fish make for good photo ops in the Bay Islands.

With the help of some heavy-duty cables, you can make like Tarzan and swing through the treetops on Roatan.

bait in a brief but explosive tangle of fins and tails. When you see the divemaster pick up the bucket, get ready to make use of your camera's autodrill.

ROATAN: Dolphins

Swimming with Atlantic bottlenose dolphins is like playing with kids—really fast, powerful, graceful kids who may be smarter than you. The dolphin program, run by the Roatan Institute for Marine Sciences, allows you to get in touch with your inner child by cavorting with the friendly cetaceans in 60 feet of water off the north side of Roatan. From Anthony's Key Resort, six divers at a time are taken just outside the reef to spend half an hour watching and interacting with a pair of dolphins. The trained animals swoop around



and among their visitors, showing off their superior swimming skills and offering the best chance you may ever have to come mask-to-bottlenose with one of the ocean's most endearing creatures.

UTILA: Whale Sharks

While whale sharks aren't quite as abundant as inexpensive dive certifications on Utila, the westernmost of the Bay Islands is still at the top of the list of Caribbean whale shark hot spots. The biggest fish in the sea congregate around the banks north of the island and may be encountered any time of the year, though the sightings occur most dependably March-May and August-October. The stately giants can grow to 50 feet in length, but pose no threat—they make a living by gulping up plankton, not divers.

BIG WRECKS

GUANAJA: *Jado Trader*

After being sunk for diving in 1987, the *Jado Trader* was for years the signature wreck of the Bay Islands. While it may no longer be the biggest wreck around, it still boasts an impressive crew of fish including dozens of Nassau, black and tiger groupers, schools of horse-eye jacks and fat green morays. The 187-foot freighter lies on its starboard side in 110 feet of water and is well-encrusted from stem to stern. You can penetrate its bridge and open cargo holds, but avoid penetrating farther in search of the shy, enormous goliath grouper that lives within. Keep an eye on the water column above the *Jado Trader* to spot the hammerheads that sometimes visit the wreck.

BIG ADVENTURE

West Bay Canopy Tour

IF YOU'RE LOOKING to balance your underwater thrills with a little topside adventure, and the idea of being suspended by your crotch 50 feet off the ground doesn't bother you, check out Roatan's latest topside offering, a rain-forest canopy tour. After your guide straps your harness around you and gives you a pair of gloves with thick leather palms, you'll be hooked onto a pulley on a thick steel cable. Then you can zip from one high tree platform to the next at speeds controlled only by your grip on the cable. You'll start at the top of the mountain above West Bay and continue on a series of 11 cables all the way down to sea level, speeding through the treetops and catching stunning vistas of the island's north shore through breaks in the canopy. Don't expect a scholarly presentation on the native wildlife, because this tour is all about the thrill of the ride—and what a ride it is. **Price: \$40.**

ROATAN: Odyssey

Local legend holds that after a fire ravaged this container ship, a Bible was found intact inside the ship, sitting on a table, untouched by the flames that destroyed everything around it. Maybe it was God's plan, then, that the 300-foot ship should be blessed with an afterlife as an artificial reef and prime attraction for divers. Sunk in November of 2002, the *Odyssey* hasn't had enough bottom time to collect much growth. But that's OK, because the most impressive thing about this wreck is its enormous size. Start at the mast, which rises to within 40 feet of the surface. If there are divers on the wreck already, they'll appear tiny, dwarfed by the colossal scale of the *Odyssey*. Make your way down to the top of the bow at 70 feet. Swim through the bow hatch and into the cavernous cargo

hold. You'll find the stern resting on the sand at 120 feet and the ship's massive superstructure rising above you. Swim up and around the structure with its intact stairwells, and you'll find barracuda, jacks and parrotfish exploring the still-developing artificial reef as you make your ascent.

ROATAN: Prince Albert

On the south side of Roatan, the wreck of the *Prince Albert* is accessible as a shore dive from CoCo View Resort. After more than 15 years on the bottom, the island freighter sports a thick coat of sponges and soft corals and hosts an array of reef fishes. Resting upright at 85 feet on a sloping sand bottom, the 140-foot wreck is frequently visited by eagle rays. Peek into the dark recesses of the wreck to find schools of silversides drifting together in perfect unison,

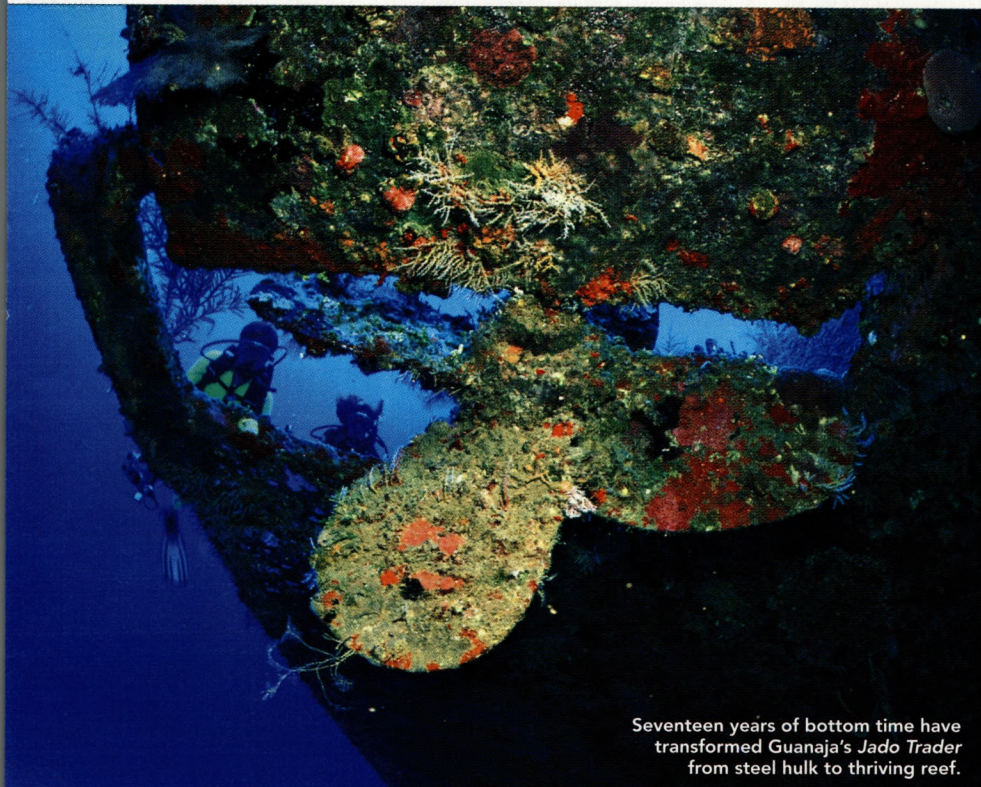
and search the deck for seahorses. After exploring the wreck, check out the colony of garden eels nearby. The *Prince Albert* is also a popular night dive, when octopuses skulk around the wreck and morays come out to hunt.

Even blue bell tunicates grow big in the Bay Islands.



At Cara a Cara Point, you can expect between eight and 20 toothy guests to show up for their regular meal.





Seventeen years of bottom time have transformed Guanaja's *Jado Trader* from steel hulk to thriving reef.

BIG REEFS

ROATAN: Mary's Place

Eons ago, the island shelf on the south side of Roatan was violently ripped apart by tectonic forces, splitting a huge section of the reef away from the main wall. The legacy of that ancient cataclysm is Mary's Place, the most popular dive site on Roatan. The main attraction at Mary's Place is the deep crack, which in places is as wide as 12 feet and as deep as 100. If you like wall diving, you'll double your pleasure by swimming between two vertical walls spectacularly decorated with rope and tube sponges, seafans and black coral. At various times during the day, sunlight streams into the crevice, illuminating the jewel colors of the reef with stained-glass brilliance. At other times, indirect light creates dancing shadows and an eerie mood in the dark canyon. Bring a light to check under ledges for fat lobsters and dozing nurse sharks.

UTILA: Black Hills

Off the southern shore of Utila, an underwater mountain rises from the seafloor,

stopping just 35 feet short of breaking the surface and becoming an island. Drop down deep over the side of the seamount at Black Hills to start your dive and then work your way around and back toward the top at one of the fishiest dive sites in the Bay Islands. Cold upwellings from the depths force plankton-rich water up the sides of the seamount, which in turn attracts enormous schools of jacks and other pelagic species. Two sides of the mount drop sharply beyond recreational depths while the other two feature gentler slopes covered with hard corals and big sponges. Like many seamounts, Black Hills acts as a magnet for open-ocean species, so keep your eyes on the blue to spot hammerheads and the occasional whale shark.

ROATAN: Half Moon Bay Wall

One of the Bay Islands' most colorful dives, Half Moon Bay Wall marks the site of a prehistoric river valley. Now under water, the ancient canyon wall plunges from 20 feet to beyond 150 feet. Schools of creole wrasse flow constantly over the drop-off

while lazy groupers hang in the current. Look for a tunnel that empties onto the wall at 70 feet among forests of deepwater fans and tube, rope and vase sponges. Here you'll find barracuda, turtles and eagle rays patrolling the wall.

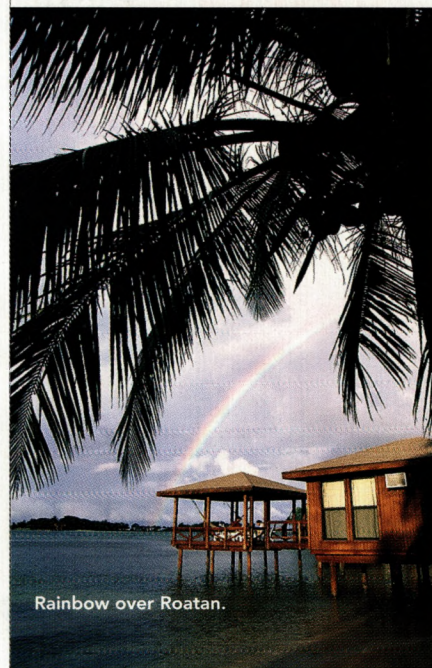
UTILA: Willy's Hole

This wall on the north side of Utila drops vertically past recreational diving depths, but not before opening up into an expansive cavern. This cavern is the "hole" referenced in the name, but not the only reason to seek out this classic site. Start the dive by following any of four twisting sand channels from the top of the reef at 20 feet down to a sandy bottom at 50 feet, which then leads to the wall. The sand flat is a great place to search out flounder, stingrays and jawfish among boulders of brain and star coral and stands of elkhorn and pillar coral. Continue to the drop-off, and you'll find the cavern at 70 feet, packed with the shimmering, potbellied bodies of hundreds of glassy sweepers. SD

GET THERE

For more information about the Bay Islands,

turn to In Depth, page 99, section 2.



Rainbow over Roatan.

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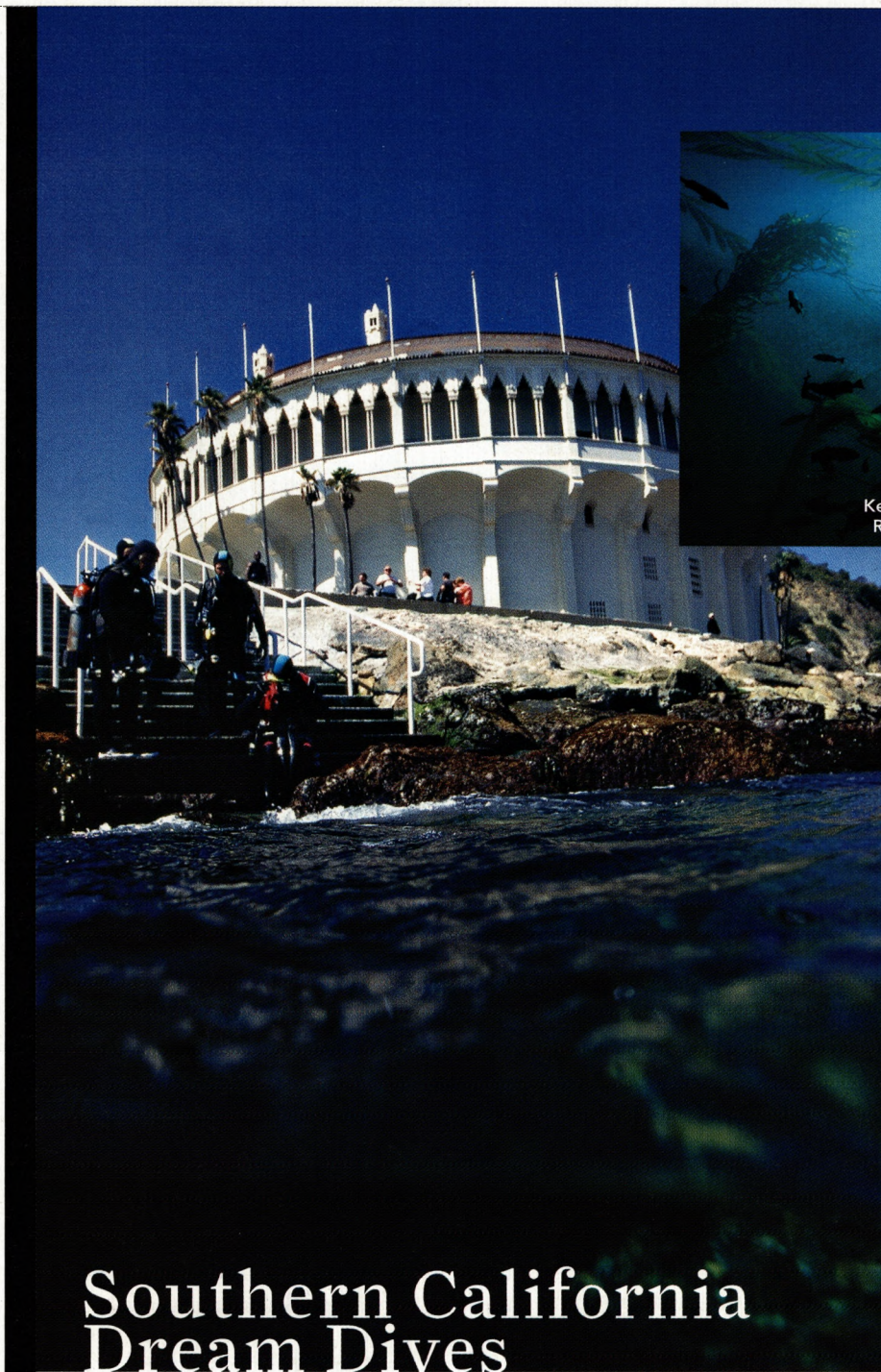
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Kelp forests are just a short swim from shore at Refugio. Left: The shore entry at Casino Point.

Southern California Dream Dives

A sampler of So Cal beach dives, where the crowds and cars end at the waterline. **BY JOHN FRANCIS**

SOME PEOPLE beyond the Sierras picture Southern California as the land of laid-back, mellow slackers in beach

shacks. They imagine a beach dive here means making a short, easy drive to an idyllic beach, sidestepping bikini-clad babes after suiting up, and taking only a few steps to the water.

More often, a So Cal beach dive means being stuck in traffic, searching, searching, searching for a parking space

and gearing up on the asphalt shoulder of the Pacific Coast Highway. Luckily, however, there are dive sites that recall the slower, more spacious California of 50 years ago.

Refugio State Beach

REFUGIO IS ONE OF THEM. Take the Ventura Freeway west from L.A., out of the Valley. Suburbia drops behind when you crest the Conejo Grade and the Pacific gleams in the distance. Old Highway 101 rolls along the grassy benchland, brown hills to your right, the sea cliff to the left. Your shoulder muscles relax and you breathe deeper.

About 20 miles past Santa Barbara, a road sign marks the turnoff for Refugio State Beach, which has more than 100 campsites under palm trees, day-use parking, rest rooms, an easy beach entry and a chain of sweet reefs just offshore.

The Spanish word *refugio* means refuge or shelter, and that's just what you'll find here. Past the flat, sandy bottom just off the beach are shallow kelp beds, where opaleye and calico bass hang out. Beyond the kelp, a series of ledges to the left have overhangs that once sheltered abalone. You might find scallop or maybe even lobster holed up.

Besides anemones and nudibranchs, there's a thriving collection of starfish among the rocks, including big bat stars,

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DRIVE & DIVE



sun stars, blood stars and varieties you've never seen before. This is a transition zone between southern and central California, and what you see on a dive varies, depending on conditions. Don't dive with a goal of seeing something at Refugio; just cruise and see what it brings.

You can easily launch an inflatable or a kayak from Refugio because the beach is flat and close to asphalt. Take a tank and explore to the west toward Tajiguas or to the east toward El Capitan for more reefs, more kelp and more solitude. L.A. can wait.

Casino Point Underwater Park

YOU'VE GOT EVERY terrain here, from sand to rock pile to walls and ledges. You've got depths from snorkeler shallow to tech deep. You've got wrecks and kelp and lots of animal life from big sea bass and harbor seals to stars and anemones with lots of senioritas and garibaldi, sheepshead and calicos, moray eels and lobster in between. All of them are unusually approachable because

they've been protected for many years. Add the clearest and warmest water in the state, convenient air fills, pavement (not sand) to gear up on and a wall to sit on while you do it, an easy entry (stairs!), no long surface swim and you've got an easy dive in aquarium-like conditions.

If a dive can be too good and too easy, Catalina Island's Casino Point Underwater Park is it. Divers, who vote with their fins, have made it California's most popular shore dive.

There's a big parking structure at the foot of the Long Beach Freeway, which, admittedly, is still 25 miles short of your destination, but don't worry. Take the Golden Shore exit, turn right at the stop sign and follow the road to the Catalina Express Landing. Park in the structure to the left. From here, you can board a ferry. Ferry departures start at 6:15 a.m. and return as late as 9 p.m., depending on the day and season. You can wheel all your dive gear on board over ramps, and because the ferry owners are used to catering to divers, a storage area is set aside for

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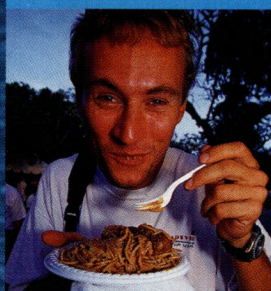
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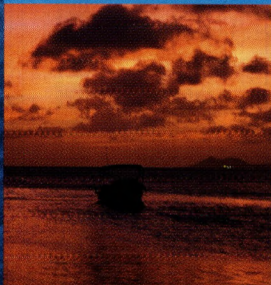


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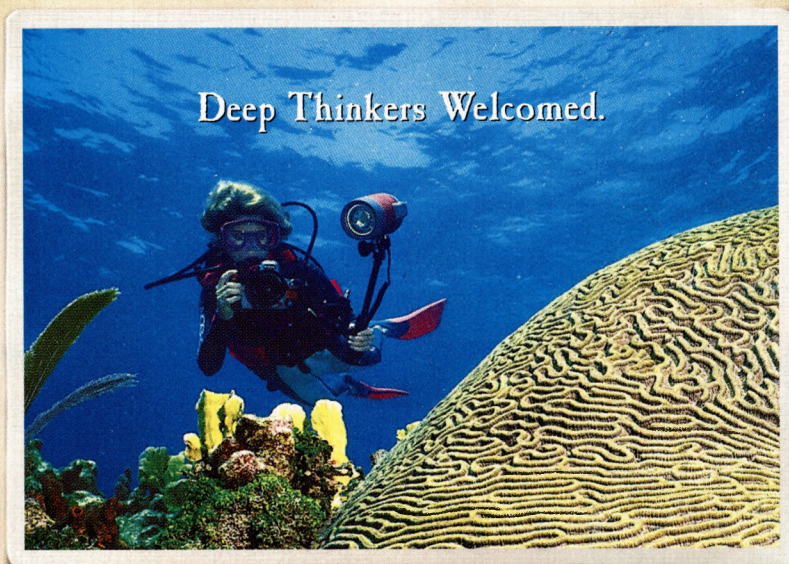
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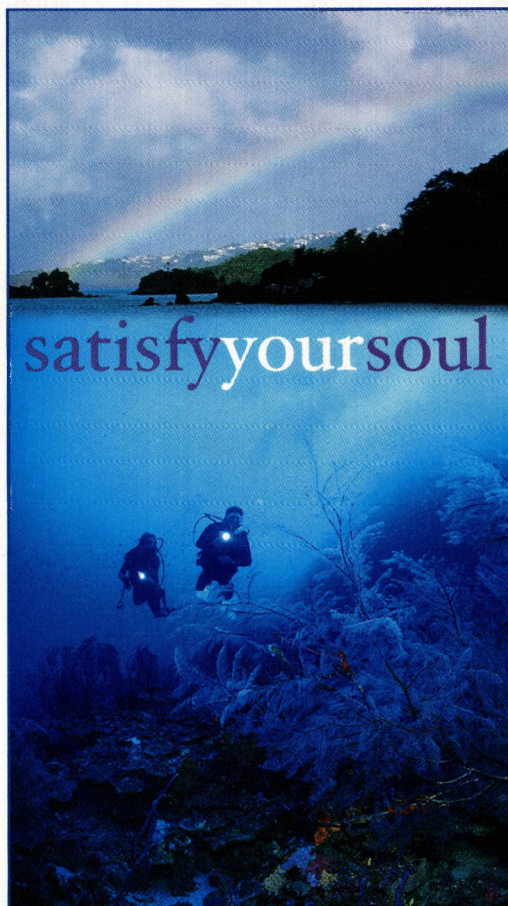
scuba gear. An hour later, the boat docks in Avalon. The Underwater Park is a 20-minute walk to the other side of the bay, but you can rent a pushcart at Catalina Divers Supply on the green pier. (You can also rent tanks and weights.)

At the end of the sidewalk just past the Casino is a large paved area. The air fill truck is here and so are the stairs into the water.

Keep an eye out for garibaldi, Catalina's signature species. The bright orange fish are often found nesting here. The male garibaldi spreads a patch of red algae, which he hopes will attract a female to lay her eggs. Once she does, the male is fiercely protective of the eggs. He'll clean the patch of debris and attack anything—and anyone—who comes near. In springtime, don't miss the wreck of the glass-bottom boat. The boat is in 60 feet of water, about 30 feet to the left of the red buoys.

Point Lobos State Reserve

ONE WAY TO AVOID crowded dive sites is to keep the crowd away from the dive site. There isn't a nightclub as exclusive as the Point Lobos State Reserve, four miles south of Carmel on Highway 1. You have to be on the guest list to dive here, and for a weekend dive, you'd better sign up two months in advance. Only 15 permits, one for each buddy team of two divers, are issued daily. And there are club rules. You must have a buddy and a BC, you must enter at the boat ramp in Whalers Cove, you may dive only in Whalers Cove and Bluefish Cove, and you may not touch, tease, chase or bother anything. Possession of banned substances—meaning hunting gear—is strictly prohibited.



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But this is one club worth the hassle of admission. Inside, it's truly wild. Powerful, cold ocean currents funnel plankton through the canyons, crevices and caverns of the reserve, generating an explosion of life. Hydrocorals, stars and anemones in dozens of species and twice as many colors cover every rocky surface. Clouds of black-smith and bluefish sheltering under the kelp are so approachable they seem tame. Large-animal encounters with seals, sea lions, leopard sharks and lingcod are common.



Several "rooms" open out from the entry at the boat ramp. To the right is Coal Chute Cove with several caverns. One, at 25 feet deep on the south shore of the cove, is a tunnel through the the point back to Whalers Cove. Though the entrance is comfortably wide, the tunnel narrows considerably before it ends in Whalers Cove. That will accelerate any surge, making a transit dangerous in anything but a flat calm. But it's a remarkable journey. Filter-feeding sponges are abundant

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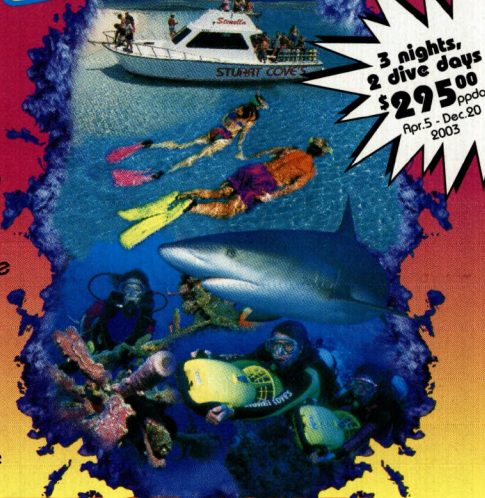


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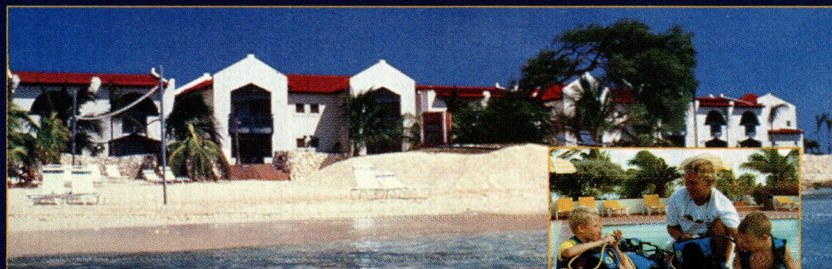
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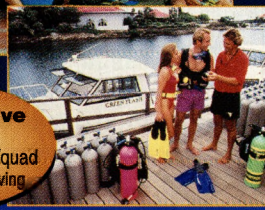
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DRIVE & DIVE

along the ceiling and upper walls, and the walls and boulders are painted in their richly colored hues.

Shaw's Cove, Laguna Beach

NOWHERE IS the land/sea contrast more striking than at Shaw's Cove in Laguna Beach. In summer, the town is jammed with tourists. But Shaw's Cove and a mystery world called The Labyrinth is far removed from the town's conspicuous consumption. Turn off the Pacific Coast Highway at Fairview and drive one block toward the ocean to Cliff Drive. Gear up and trudge down the stairs to the beach and wade in. Follow the west wall of the cove past the surf line until the bottom depth reaches about 30 feet. A canyon is to your right with an arch over it.

Swim under and into an area of crevasses, canyons, chutes and tunnels, jeweled like Aladdin's Cave with anemones, nudibranchs, urchins and stars. The canyon walls lean in above you, and in the gloom cracks and crevasses appear on both sides. After passing over a large rock in the floor, the canyon becomes tighter, the overhanging walls almost touching above you. Now you're in a cave, or rather a tunnel, as the end of the canyon opens into Crescent Bay, the next cove to the west. If the ocean is still, you can actually pass through, but any swell is magnified in the narrow reaches of the canyon and the many rocks on the floor make this dangerous. SD

GET THERE > For more information

about shore diving off Southern California, turn to In Depth, page 101, section 5.

Early Spring Super Savers

With these 15 deals, you can get free stuff, get married or get wet—all at great prices.

BONAIRE

Seven Nights for \$583

1 THE DEAL: Captain Don's Habitat offers an eight-day, seven-night special from April 4 to Dec. 18, 2004, for \$583 p.p., quad. occ. Guests stay in a Habitat cottage and enjoy a daily buffet breakfast, welcome drink and manager's cocktail party. Price includes unlimited shore diving, tanks and weights, all service charges, taxes and airport transfers. (www.habitatdiveresorts.com)

KEY LARGO, FLORIDA KEYS

Multi-Trip Discount

2 THE DEAL: Purchase three trips with Horizon Divers through Dec. 31, 2004, and receive a 15 percent discount off the regular rate of \$180. Purchase five trips and receive a 20 percent discount off the regular rate of \$300. Each trip consists of two boat dives and one night

dive per day. Price includes tanks and weights, but doesn't include tax. (800-984-3483, www.horizondivers.com)

CAYMAN BRAC

Live Like Royalty

3 THE DEAL: Divi Tiara and Divi Dive Tiara offer a seven-night discounted dive package for \$779 p.p., dbl. occ., until April 18, 2004. Package includes six dives, breakfast, airport transfers and taxes. Tanks are available for shore diving, but guests must arrange transportation. Upgrades are available. (800-367-3484, www.divitiara.com)

PROVO, TURKS & CAICOS

Make Large Groups Count!

4 THE DEAL: Turtle Cove Inn and Provo Turtle Divers offer two free trips with a group of 12 paid divers. Summer rates, valid April 6 to Dec. 20, 2004, start at \$346 p.p., dbl. occ., for four days, three nights and two days of diving. Winter rates start at \$406 and are valid

through April 5, 2004. Rates include tanks and weights. (800-833-1341, www.provo-turtledivers.com)

COZUMEL, MEXICO

One-Stop Shop

5 THE DEAL: Scuba Club Cozumel offers a \$599 p.p., dbl. occ., special when you mention *Scuba Diving*. Divers get five nights, four days of boat diving, unlimited shore diving, and three meals per day. Special is valid March 1-31, 2004. (800-847-5708, www.scubaclubcozumel.com)

MOOREA, FRENCH POLYNESIA

Stay Six Nights, Pay for Five

6 THE DEAL: Dive Tahiti Blue offers a six-night stay at the Moorea Pearl Resort for the price of a five-night stay. Package includes 10 dives with Moorea Blue Diving, daily breakfast and dinner, a welcome flower lei, taxes, airport transfers and inter-island airfare. Mention *Scuba Diving* for a free stingray feeding excursion. Depending on the daily exchange rate, the price is approximately \$1,872. Package is valid through May 31, 2004. Round-trip airfare is an additional \$860 p.p. (www.divetahitiblue.com)

GRAND TURK, TURKS & CAICOS

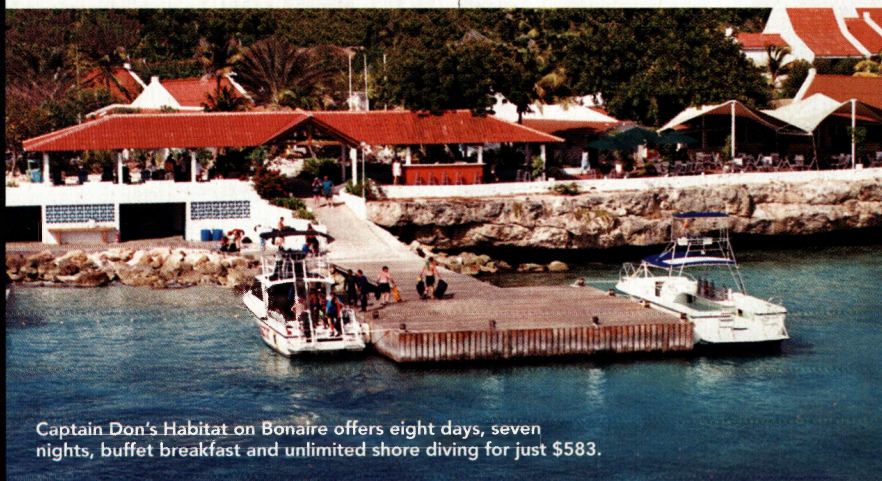
Spring Special

7 THE DEAL: Spend six days diving (two tanks per day) with Blue Water Divers and seven nights in the Osprey Beach Hotel for \$925 p.p., dbl. occ. Special includes shore diving, tanks, weights, guide service, airport transfers, taxes and welcome drink. Include a night dive, and Blue Water Divers will give you two for the price of one. Rates are valid through March 31, 2004. (www.grandturkscuba.com)

MAUI, HAWAII

Scuba Shack

8 THE DEAL: Visit Scuba Shack for seven nights and days at a discounted rate through Dec. 31, 2004. It's \$750



Captain Don's Habitat on Bonaire offers eight days, seven nights, buffet breakfast and unlimited shore diving for just \$583.

COURTESY OF CAPTAIN DON'S HABITAT

p.p., dbl. occ., to stay in the condo and \$600 p.p., dbl. occ., in the guest house, taxes included. Rates include three days of boat diving, two tanks per day, free use of tanks and weights for shore dives, free use of dive gear on boat dives, and snacks and beverages on the boat. (877-213-4488, www.scubashack.com)

TRUK, MICRONESIA

Three Freebies With Group Trip

9 THE DEAL: When 11 paid divers book Aggressor's Truk Lagoon trip between June 20 and Dec. 26, 2004, three additional divers go free. Guests stay on the 18-passenger Truk Aggressor II live-

aboard, which explores the World War II ships, planes and submarines of Truk Lagoon. Charters are seven nights, with five and a half days of diving for \$2,295 p.p., dbl. occ., and \$2,095 p.p., quad. occ. (800-348-2628, truk@aggressor.com)

THE BIG ISLAND, HAWAII

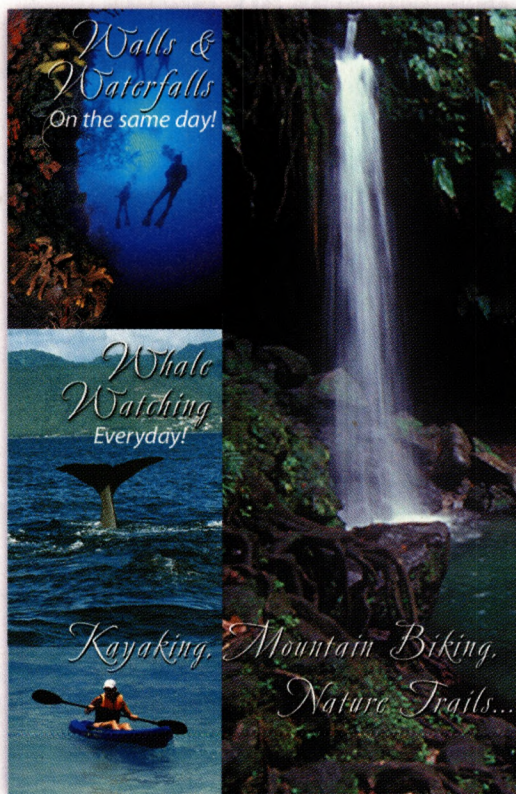
Deuces Wild

10 THE DEAL: Dive operator Kona Honu Divers offers two specials: a free luau with two days of morning dives, two tanks per day at two locations each day, for \$175 p.p.; or extend your time to four days of diving for \$310 p.p. and get the fifth day free. The special is good through May 30, 2004. (www.kona-honudivers.com)

ST. CROIX, U.S. VIRGIN ISLANDS

Wet Wedding Package

11 THE DEAL: Hotel Caravelle of St. Croix offers a Wet Wedding package for couples who want to tie the knot beneath the waves. Couples get four days and three nights for \$1,440, including accommodations, two dives, underwater wedding services performed by Captain John Macy, a candlelight dinner at Hotel Caravelle's waterfront restaurant, his and her T-shirts, champagne, flowers



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HELP FUND SHARK RESEARCH

THE SHARK RESEARCH Institute (SRI) tags whale sharks in the Galapagos Islands to better understand their behavior and migration patterns, and now Galapagos Adventures offers a \$150 discount off any Galapagos trip booked directly through them to anyone who donates \$150 or more to SRI. Because SRI is a nonprofit organization, contributors are eligible for a tax deduction. (866-626-8272, www.galapagosadventures.com)

in the guest room and a choice of a Buck Island or safari land tour. All taxes and service charges are included, but the \$100 marriage license is additional. Airfare is not included. Rates are valid through September 2004. (800-524-2030, www.hotelcaravelle.com)

YAP, MICRONESIA

Critter Hunt

12 **THE DEAL:** From June 23 to July 21, 2004, Larry Smith and Bill Acker lead dives to search for rare species. For \$1,715 p.p., dbl. occ., you'll stay seven nights at the Manta Ray Bay Hotel and do 15 critter explorer dives, plus five nighttime exploration dives with Yap Divers. Breakfast, snacks on the boat, dinner, airport transfers and taxes are included. Space is limited to 10 guests per week. (800-348-3927, www.mantaray.com)

ST. THOMAS, U.S. VIRGIN ISLANDS

Spectacular View

13 **THE DEAL:** Dive St. Thomas with Blue Island Divers and Mafolie Hotel for \$775 p.p., dbl. occ., until May 4, 2004. Price includes five nights of accommodations and three days of two-tank dives. Hotel taxes are included. Upgrade to seven nights and five days of two-tank dives for a rate of \$1,115. These packages are also available with summer rates. (888-462-8875, www.caribbeandivevacations.com)

TOBAGO

Summer Splurge

14 **THE DEAL:** From June 1 to Oct. 15, 2004, Blue Waters Inn offers seven nights and seven days for a discounted \$703.55 p.p., dbl. occ. Guests spend five days diving with AquaMarine Dive, two one-tank dives per day. Additional dives are extra. Special includes taxes, daily breakfast and airport transfers. (www.bluewatersinn.com, www.aquamarinedive.com)

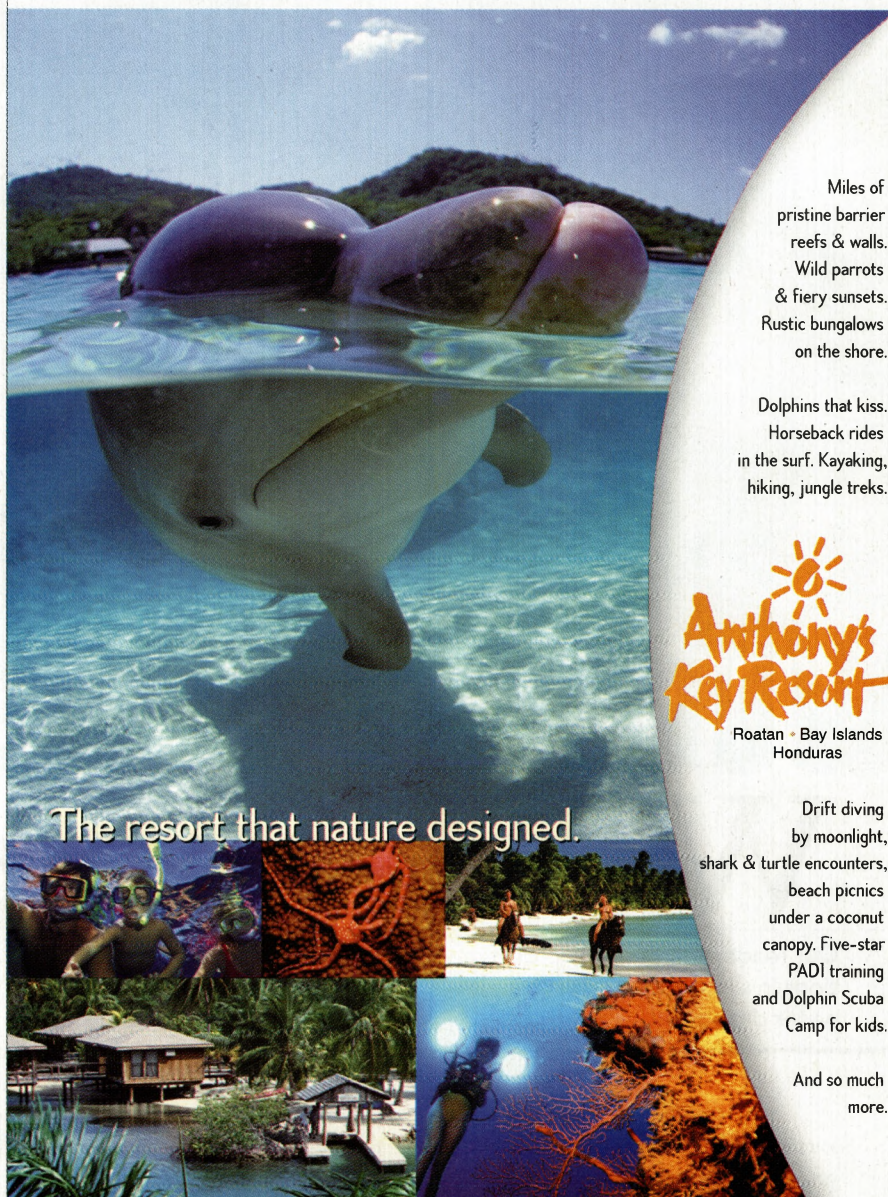
COZUMEL, MEXICO

With Group of Eight, the Special's Sweeter

15 **THE DEAL:** Scuba Du and Presidente InterContinental offer a package that includes three nights' accommodations, two days' boat diving with two tanks per day, unlimited shore

diving, tanks, weights, bottled water, fresh fruit on the boat, daily buffet breakfast, welcome drink and a 25 percent discount on night dives. Book seven rooms and get the eighth room free. Price is \$345 p.p., dbl. occ., valid through Dec. 25, 2004. (www.scubadu.com, www.intercontinental.com)

SD



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The World's Best Wall Diving

(SCORE: 96)

1 Palau

THE WORLD-FAMOUS sites in Palau's southern Rock Islands have everything you could want in a wall dive—they start shallow, they drop vertically and they bottom out deep. **Big Drop-Off** (also known as **Ngemelis Wall**) starts so shallow, in fact, that if you were to stand on the reef at the top of the wall, you'd probably be able to keep your

ROD KLEIN (ABOVE)

Our readers name the top destinations in the world for diving underwater drop-offs.

WHEREVER deep water meets shallow, where open ocean abuts thriving reef, you're likely to find spectacular diving. And

that's what walls are all about—the interface between the kaleidoscopic shallows and the vast blue depths, where reef dwellers thrive and pelagic species lurk. *Scuba Diving* readers rated dozens of dive destinations to help you find the best places in the world—from the well-known to the unknown—to find your back against a wall.

(SCORE: 94.9)

2 Little Cayman & Cayman Brac

THE CAYMAN ISLANDS are where the recreational diving world first discovered the joys of wall diving, and they remain unsurpassed in the hearts and minds of many vertical-dive junkies. On the north side of Little Cayman, **Bloody Bay Wall** is home to some of the world's best-known dive sites, including the dramatically adorned **Great Wall** and the deep swim-through canyons of **Marilyn's Cut**. Cayman Brac operators make regular trips to Little Cayman wall sites, but have plenty of their own to explore, too. **Garden Eel Wall** and **Anchor Wall** start between 60 and 70 feet, and are blessed with swim-throughs and coral pinnacles.

(SCORE: 94.4)

3 Grand Cayman

THE ISLAND THAT IS practically synonymous with wall diving is surrounded on all sides by world-class drop-offs. The most frequently dived sites can be found in the aquarium-like conditions of the West End. Read the names of the sites along the **West Wall**—**Orange Canyon**, **Trinity**

Caves, **Big Tunnels**—and you'll quickly understand the attraction. This wall is riddled with swim-throughs, crevices and passageways. The water conditions along the **North Wall** can be a little rougher than in the west, especially in winter, but dives here often pay off with bigger marine life, including eagle rays and sharks. The **South Wall** starts deeper than those on the west and north sides and features the island's most prolific soft corals and sponges. The walls on Grand Cayman's **East End** also start deep, and some of the best dives are made among the canyons and swim-throughs on top of the wall.

(TIE)

Washington State

SCORE ONE for the cold-water crowd. Washington's appearance on this list of the world's best wall destinations is a surprise only to divers who've never been there. Cold-water walls may look different from those in the Caribbean and tropical Pacific, but they hold just as many thrills for the hardy souls who are willing to seek them out. Puget Sound sites like **Day Island Wall**, **Point Defiance** and **Waterman's Wall** feature rocky crags, ledges and crevices that harbor two of the best reasons to don a dry suit: giant Pacific octopuses and wolf eels.

It's easy to get steep in Grand Cayman, an island that is literally surrounded by world-class walls.

mouth above the surface. Down below, the spectacular precipice is decorated with ornate crinoids, soft corals, enormous sponges and blankets of reef fish. For pulse-pounding pelagic action, head for **Blue Corner**, where the wall takes a hard 90-degree turn, projecting out into the open blue. From this sweeping vista, divers watch the procession of gray reef sharks, whitetip sharks, eagle rays and squadrons of barracuda that number in the hundreds.

TIM ROCK (RIGHT)

Every inch of Palau's famous walls is packed with life.

(SCORE: 92)

5 Grand Turk & Salt Cay

DIVERS LOVE THE WALL off the west side of Grand Turk, not only because it features soaring coral arches and sandy chutes leading to sheer drop-offs, but also because it's close. You'll barely have time to pull on your wetsuit before your boat arrives at favorite sites like **McDonald's** and **The Library**. Likewise, off nearby Salt Cay, the wall drops 7,000 feet just 100 yards from shore.

(SCORE: 91.3)

6 British Columbia

LIKE SNOW on the Rockies, white plumose anemones cover many of the dark rock walls of Canada's



Grand Turk's wall starts just 300 yards off its west coast.

most popular dive destination, offering breathtaking underwater views. Off Port Hardy on the north end of Vancouver Island, **Browning Wall** offers more color, in the form of orange and red anemones, sculpins and nudibranchs.

(SCORE: 88.4)

7 Cozumel

THE CURRENTS that sweep past Cozumel's southwest corner bring nutrients to feed abundant life on the island's steep reefs. Divers flock here to

STEPHEN FRINK



YOU'RE INVITED TO JOIN THE DISCOVER PUERTO RICO MAY 8-15, 2004



Join professional photographers/videographers Georgienne Bradley and Jay Ireland for a very special week of diving, sightseeing and photos tips in the tropical paradise of Puerto Rico. Bradley and Ireland will be on assignment for *Rodale's Scuba Diving*, and as their guests, you will follow them as their story unfolds, gaining access to and exploring areas off the beaten path.

The backyard of the Copamarina Resort is the Guánica Dry Forest which has been designated a Biosphere Reserve by the United Nations' UNESCO. You'll visit the forest to search for the endangered Sapo Concho toad, to view the many species of residential and migratory birds, and to explore the mangroves.

New Fuji Provia 100 film will be provided free for participants.

drift past classic Cozumel walls like those at **Santa Rosa, Columbia** and **Punta Sur**.

(SCORE: 85.7)

8 Papua New Guinea

A WEEK ON a live-aboard in Papua New Guinea will pay off with pinnacles, World War II wrecks, sharks and, yes, walls. From **Kavieng, Madang, Kimbe Bay** or **Milne Bay**, you'll have access to walls covered with an astounding variety of fish and corals.

(SCORE: 85.5)

9 U.S. Virgin Islands

IF YOU WANT to get vertical in the Virgin Islands, head for St. Croix,

where two distinct wall dives are separated by a yawning chasm. **Salt River East** drops steep and deep and is forested with black coral. **Salt River West** is marked by narrow passageways where sections of the reef have separated from the main wall.

(SCORE: 81.8)

10 Egyptian Red Sea WALLS ABOUND

in the Red Sea, where the typical seafloor profile is a sharp drop close to shore. Popular sites can be found off **Sharm el Sheikh** on the Sinai Peninsula and off **Hurghada** in southern Egypt. 

A Red Sea wall.

HOW WE GOT THE SCORES

RESULTS ARE based on a response of more than 6,000 surveys. Readers rated dive destinations in a variety of categories on a scale of one to five. Scores listed here represent the percentage of fours (very good) and fives (excellent) awarded to each of these destinations in the wall diving category. A minimum number of responses was required for a destination to be included in these ratings.

TAMMY PELUSO

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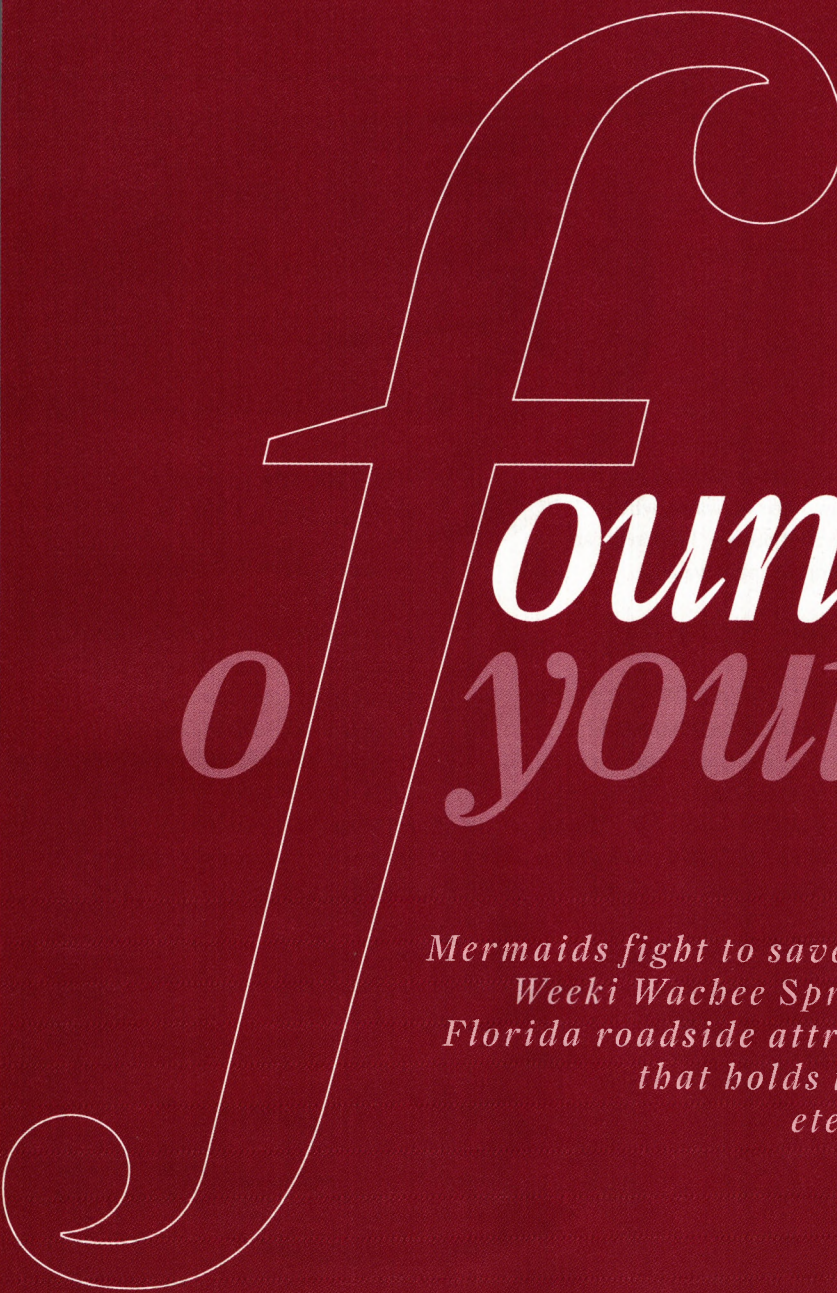


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fountain of youth

*Mermaids fight to save
Weeki Wachee Springs, the
Florida roadside attraction
that holds the key to
eternal girlhood.*

*by vicki glembocki
photography by tim calver*

People have been coming to see the mermaids of Weeki Wachee since 1947. In the early days, they drove 50 miles north from Tampa, 80 miles west from Orlando, navigating the narrow two-lane Route 19 into remote Hernando County, to Weeki Wachee River, which winds into the gulf. Weeki Wachee was one of Florida's 137 famed roadside attractions, an all-weekend family adventure, complete with a Seminole village, glass-bottom boats, a pig that could count. But it was the mermaids who called them—up to a million people each year.





Celebrities came—James Darren, Danny Thomas, Don Knotts, Arthur Godfrey, John Davidson. Even Elvis came. When Disney World opened in 1971, the cars started driving to Orlando instead. But the mermaids held on. Owners changed and changed again, making money but rarely putting any back into the park. Attractions closed. Buildings fell into disrepair. But the mermaids kept swimming, though their spring was growing

algae, their audiences were shriveling, and their park was barely pulling in enough money to pay its staff. Finally, this year, the park's landlord decided enough was enough—spend \$2 million and fix Weeki Wachee or we'll close it down. The mermaids launched a fund-raising campaign—"Save Our Tails." They're praying they can raise enough.

Today, though, on a Saturday morning in October, people have come. Lots of people—most of them retired, most with gray hair. They're not here for the mermaids; they're here for the big crafts show at the park this weekend. But, at 11 a.m., they pack the theater, 15 feet under the water. And what a day to come. Not only can they see the regular show, "The Little Mermaid," at 11 and 3, they can also catch a special performance in between. A group of former mermaids—ages 49 to 73!—are putting on a show of their own, "The Tails of Yesteryear."

Upstairs, above the underwater theater, in the big rehearsal room in the Mermaid Villa, Crystal Robson digs through the refrigerator, hunting for something to eat. Dottie Meares is supposed to bring the bananas—it's part of their act, eating a banana and drinking a Coke under water. But Dottie is late. Their show starts in 45 minutes. Crystal pulls out the only edible item in the fridge—an apple so wrinkled it's probably been in there since Crystal first performed here in 1970.

The "Mermaids Only" door to the villa squeals open. All five mermaids, waiting in their costumes—full-piece blue lycra swimsuits with a blue plastic amulet around their necks—turn toward the door. It's not Dottie. It's Susie Pennoyer; she swam from 1971 to 1973. She turns 50 next month. And she doesn't even have her mermaid make-up on yet.

"Hurry. Hurrrrrry," yells Lynn Columbo, the group's choreographer, who just turned 50 herself, but is so tall and so thin that she

must look the same as she did when she first put on the tail in 1973. "We have to practice our spacing."

"I'm hurrying, I'm hurrying," Susie says, scuttling past the mermaid's time clock, past the Santa suit hanging from a hook on the wall, past the green ballet bar, up the short flight of stairs and through the door to the dressing room where a sign is posted: "Today is a great day to be a mermaid."

Today, however, is not a great day to be Dottie.

"She's always late," huffs Lynn, cuing the music on the boombox to their opening song, "NeverEnding Story." The mermaids take their places in a V formation in front of the wall of mirrors. Susie runs in, her costume on, her long brown hair hanging straight down her back. They all have long hair. Mermaids are supposed to have long hair.

"Do you want DuWop on your lips?" Lynn asks Susie. So far, Lynn's convinced half the girls to try this lip gloss that's supposed to swell lips and make wrinkles disappear. Mermaids are not supposed to have wrinkles.

"It burns," warns Beverly Sutton, who swam from 1969 to 1972. "There's cayenne in that stuff."

"They look better than they did," Lynn says, pointing to her face in the mirror.

"Do you think it works on your boobs?" asks Susie.

"Or on the wrinkles around your eyes?" asks Lynn.

"Or on the cellulite under your arms?" asks Barbara Wynns, grabbing the skin under her upper arm and shaking it. Barbara has been at the park since 10 this morning, arriving all gussied up in her "young outfit," blue-jean pedal pushers and a denim vest with "Mermaid Barbara" embroidered on the front and on the back "Weeki Wachee Mermaid: 1967-1969 and 1973-1975." She wore the silver medallion necklace she received when she was promoted to mermaid. She also wore a wig that made her brown curly hair look more shiny and full. The patch sewn on her vest from the park's 50th anniversary in 1997 means a lot to Barbara. That's when everything changed, when her dream finally came true, when she got on the air hose again.

When other little girls were aspiring to be teachers and ballerinas, Barbara wanted to be a mermaid. When she was 13, her father took the family on a tour of the state, stopping at a bunch of roadside attractions—St. Augustine, Sunken Gardens, the Ringling Brothers Museum, Weeki Wachee Springs. Barbara sat in the underwater theater, mesmerized. They ate under water. They danced under water. They rode bikes under water. The mermaids weren't even wearing tails back then, but Barbara figured it out



One weekend a month, former mermaids, ranging in age from 49 to 73, gather at Weeki Wachee Springs to perform and relive a portion of their youth in a show called "The Tails of Yesteryear."



Barbara Wynns knew from the time she was 13 that she wanted to be a mermaid. Her dream came true when she was 17, and then again in 1997, after she had been off the air hose for 22 years.

quick: These girls were getting paid to play in the water.

On Thanksgiving Day during her senior year in high school, Barbara came back to the park, waiting in the line that snaked all the way across the parking lot. She was 17—a year too young to get hired, she knew—but hell if she wasn't going to try. Jeannie, the mermaid supervisor, gave Barbara the test—hold your breath under water for 30 seconds, swim across the spring and back, look up from the water and smile. Barbara passed. From then until she turned 19, Barbara could come down on the weekends to train.

The biggest challenge was learning the air hose. Each of the nine hoses attached to its own compressor. The mermaids held the hoses in their mouths, clenching their teeth on the tip to start and stop the airflow. When Barbara wasn't announcing the show or posing for pictures or selling Cokes, she was in the water, figuring out how to get buoyant with the air hose, how to equalize her ears, submerged in the 72-degree spring for a solid hour at a time.

Barbara was always wet, always cold, and always there, every weekend except for the few that her mother forced her to miss—for prom, for the class trip to Washington, D.C. On the day she graduated from high school, she drove directly to Weeki Wachee and moved into one of the cottages on the grounds where most of the 32 mermaids lived. The theater was always packed, and the mermaids couldn't go anywhere without being recognized. Tupperware and Windex and Clairol filmed commercials starring them. Part of *Route 66* was shot in the spring. It seemed like everyone in the country knew about the Weeki Wachee mermaids.

Barbara had no idea that when she left the job for good in 1975, she'd spend the next two decades longing to come back. She got

married three times, divorced twice. She designed eyeglasses, certified scuba divers, became a nutritionist, and settled in D.C., where she and her husband Bobby now have one home; the other is a few miles away, right on Weeki Wachee River. But, during all those years, when someone asked her what she did, she always gave the same answer: "I'm a mermaid." In 1997, when she received the letter about a mermaid reunion and show to celebrate the park's 50th anniversary, she felt like John Glenn must have when he was invited to go back into space. She just had a bit part—feeding the fish and flipping back behind a rock—but she was there. On the air hose. Living her dream. Ever since, one weekend each month, she and a small group of former mermaids perform the "Tails of Yesteryear." Barbara never misses a show.

It's 20 minutes to showtime, and the mermaids are just finishing up the ballet to their finale, "My Heart Will Go On," when Dottie bursts through the door. She's wearing a miniskirt and two-inch-high beige mules. She is 73. And she has the bananas.

"Oh, thank God," Lynn says.

"We can never explain to you the joy of life as a mermaid ..." The taped voice-over plays as the curtain inches up. "... this is our fantasy dream, our never-ending story." The music starts. And there they are, tails and everything, wrinkles and everything, 50-plus years and everything, performing all the classic moves they did when they were 19—the dolphin backflips, the pinwheel turns, even the "Ferris wheel" where they hold on to each other's ankles and rotate in a perfect circle. At the end of the song, the girls clasp hands, lift them above their heads and float to the surface in a



fountain of bubbles. They look so natural there, as if they truly haven't aged, as if the waters of Weeki Wachee are as magical as they say they are.

Barbara, Susie and Crystal order salads, and Bev gets Cajun chicken. They're famished; the show takes a lot out of them. This weekend, they decided to check out the new Ruby Tuesday. It just opened a few miles from Weeki Wachee. So did

Johnny Carino's. And Red Lobster. And Saint Sebastian's Belgian Brewery. And the second Super Wal-Mart. And the third Wendy's—all bolstered by the development that's sprawling north from Tampa, spreading out from the new Suncoast Expressway that runs along Florida's lifeline, the aquifer.

That's exactly why Southwest Florida Water Management District, known as Swiftmud, bought Weeki Wachee and its 442 acres from the City of St. Petersburg in June 2001. All of Florida's springs flow into the aquifer, and with the droughts and the development, the water levels are shrinking fast. With the park in such bad shape and in such serious debt—last year, it was \$173,000 in the red—and with its sewage system dating back to the '70s and threatening contamination of the precious river water, Swiftmud the landlord had to do something. Last summer, the private investors running the park quickly handed over the management of the 30-year lease to the City of Weeki Wachee—the park, the Hampton Inn across the

For now, even with the park in financial trouble, the show goes on at Weeki Wachee. At right (left to right): A mermaid welcomes a young visitor, two mermaids perform the "Ferris wheel," and a potential future mermaid strikes the pose. Left: Barbara Wynnns performs in "The Tails of Yesteryear."



highway, a shopping center, and nine residents, led by Mayor Robyn Anderson, a 30-year-old former mermaid and general manager of the park. Robyn may be young, and her beautiful waist-length blond waves may be the envy of every mermaid in Hernando County, but she knew what to do. Saving the park was a good cause and all—important enough to double the city's property taxes—but saving the mermaids would make much better PR. So much better, in fact, that it landed the "Save Our Tails" campaign on the front page of the *New York Times*, on the Reuters wire, on the *Today* show, on *NBC Nightly News*, on *CBS News Sunday Morning*. And, wouldn't you know it, those mermaids—both former and current—raised \$5,000 in a few short weeks. Home Depot donated wood. Locals donated time. They knocked down a termite-infested building, built new boardwalks. Now, all that's left is the big kahuna—the \$200,000 sewage system. If they fix that, the mermaids might get to keep mermaiding after all—preserving their jobs, preserving the park, preserving the fantasy that sustains the ladies sitting around the table at Ruby Tuesday, digging into the restaurant's signature Chocolate Tallcake with layer upon layer of mousse, Oreos, caramel, fudge, vanilla ice cream and whipped cream.

The check comes and the girls head to their cars—Susie's burgundy Dodge Caravan for carting around her two teenagers, and Barbara's massive white Ford Expedition with her vanity plate: WKI WCHE. On the way to Barbara's house, they make a quick pit stop at Bealls department store. The mermaids want to buy shoes.

Barbara's headlights shine into the carport and illuminate a life-sized mannequin bolted to her house. The mannequin is dressed in a bikini top and a green tail. Inside, on the basement level, next to the closet where Barbara stores all of Weeki Wachee's mermaid memorabilia—videotapes, black and white photos, every newspaper article ever written—there's a poster-sized photo of her from the glory days hanging on the wall. She's 19, with thick brown hair swirling around her head, bubbles escaping from her wide smile, her iridescent turquoise tail glistening and new. She still has that tail. It's hanging on the wall in her spare bedroom.

Upstairs, Susie lights every candle in the place, Bev mixes a few

strong rum and Cokes, and they all gather on the deck out back, looking onto Weeki Wachee River as the sun sets into twilight. There's another mermaid mannequin here, reclining, her torso skewered on an iron post, her arm outstretched as if she's calling to the trawling boat inching its way toward a nearby dock. Barbara pulls out the sequined purse with a mermaid on it. It's the purse she'll be carrying this Tuesday when she goes to Bartow for Weeki Wachee's next meeting with Swiftmud. They need to convince the district to extend the deadline for fixing the sewage system—they'd never be able to get it done in two months. Already, Barbara's organized a busload of her Red Hat Ladies to make the two-hour trip with her, all of them wearing the purple shirts Barbara had made with "Save Our Tails" silkscreened on the front.

"Tuesday's big," Barbara says. She bets the district scheduled the meeting in another county so no Weeki Wachee supporters would come. "Last time the Red Hatters went, we got a lot of press."

The girls retreat to Bobby's bedroom, passing under the antique wooden mermaid hanging from the living room ceiling, breezing down the hallway lined with mermaid photos and clippings that tell the story of Barbara's life. They angle for space on Bobby's waterbed to watch videos Barbara has brought up from the closet downstairs. Barbara is the star in all of them, the unofficial Weeki Wachee spokesperson, in her wetsuit at 7 a.m. for the live *Today* show broadcast, translated on the program from the Chinese station that came to film the park last month.

"Look at my wrinkles," Barbara moans.

"They must be drawing them on, Barbara, because we can't see them," Bev says.

"I look like I'm rotting."

The phone rings. It's Barbara's mother. There's a mermaid movie on PAX. Barbara rushes to the TV and flips off the VCR. She surfs the channels with the remote until she finds it. It's more than a half-hour into the flick, but the plot's easy to piece together. Three mermaids are trying to avenge their father's death.

"This one's good," Bev says. "Lynn once caught one in the middle of the night where the mermaids were eating people."

"They always make mermaids evil," Crystal says.

These mermaids are not evil. They're young and thin. They have long hair. They know exactly what they need to do to survive. And nothing will stop them. SD

A close-up photograph of two nudibranchs (sea slugs) feeding on a tunicate. The nudibranch in the foreground is green with yellow and orange stripes and is positioned at the bottom of the frame. The nudibranch in the background is white with brown and red markings and is positioned in the upper middle of the frame. Both nudibranchs have long, red, segmented appendages (cerata) that are extended towards the tunicate. The tunicate is a pale, textured, and somewhat translucent structure with blue and yellow markings. The background is a dark, out-of-focus underwater environment.

The invertebrate life found off the Raja Ampats is so rich that you might find two different species of nudibranchs feasting on a single tunicate.

BY BURT JONES AND
MAURINE SHIMLOCK

Log

Raja Ampats, Indonesia

A SMALL SLICE OF THE Pacific Ocean in Indonesia is widely regarded as the center of marine biodiversity, with more species than any other spot in the world's oceans. And in this area, the Raja Ampat Islands are considered the "heart of the heart of marine biodiversity."

The Raja Ampat Islands are scattered over the transparent seas of Indonesia's Bird's Head Peninsula in western Papua Province. The name means "Four Kings" and pays homage to the four major islands, Misool, Salawati, Batanta and Waigeo, whose reefs have marine biologists from Australia to New York dropping their jaws in awe. All previous fish and coral counts have been obliterated by the number of species recorded in the Raja Ampats. On one remarkable day, scientists observed more than 280 fish species during a single dive.

The buzz is just beginning to circulate about the Raja Ampats' premier sites, including Kai, where the reef straddles the equator. Begin the dive on the northern side and drift under water into the Southern Hemisphere.

(A VISUAL TOUR
ABOVE AND BELOW)

DIVERS EMBARK FOR THE RAJA AMPAT ISLANDS

from Sorong, about three hours by plane from Bali. A lively market town on mainland Papua, Sorong is a cultural melting pot of native Papuan Melanesians, Asians of various nationalities, and lost generations of traders from the Middle East and Africa. Most of the area's live-aboard dive boats stock up in Sorong with a week's supply of local fruits and vegetables, then head north and west toward Waigeo, where islands sprout from the sea like green Hershey's Kisses. Dive dinghies twist and turn through a maze of palm-studded rocks and hidden coves that shelter a variety of seascapes ranging from soft-coral-covered walls to muck bottoms inhabited by bizarre creatures. After diving, you can explore Waigeo's virgin beaches or hike a narrow, nearly vertical trail to the top of the island's limestone cliffs, home to flocks of sulphur-crested cockatoos and rainbow-colored parrots.



Sorong market

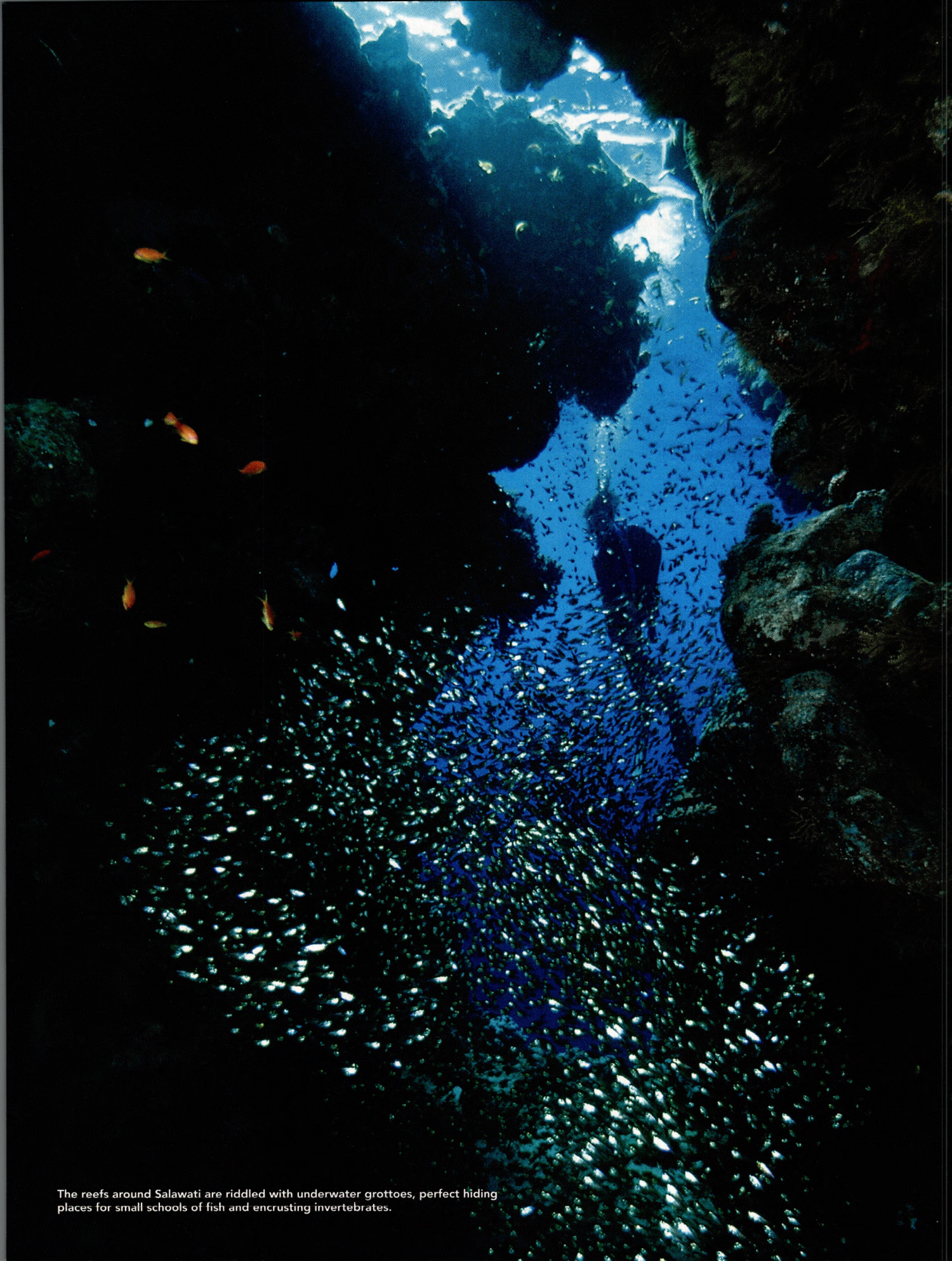


Waigeo's rock islands and azure seas rival any tropical destination for drop-dead topside beauty.



Normally a bottom-dweller, a painted scorpionfish nestles in a barrel sponge on one of Misool's vibrantly colored drop-offs.

ISOLATED FROM THE MAINLAND, marine and terrestrial species around the Raja Ampat Islands have adapted to life within their specific microenvironments. One reason this area is so rich is its east-west position relative to the prevailing north-south oceanic currents. The islands form a barrier that sweeps many animals from giant manta rays to inch-long mantis shrimp into a sort of underwater transit lounge. They flourish here, then reproduce and send their minute offspring into the currents to drift south through the Banda Sea.



The reefs around Salawati are riddled with underwater grottoes, perfect hiding places for small schools of fish and encrusting invertebrates.



An osprey warily eyes local fishing canoes and waits for its chance to hunt in the lagoon.

A juvenile pinnate batfish.



YOU CAN EXPERIENCE VERDANT BATANTA and its neighboring islands from a choice of world-class live-aboards or a remote shore-based diving camp that shares its pristine setting with several native villages. In this area of the Raja Ampats, lush reefs studded with yard-long giant clams begin just below the surface and extend well past 100 feet. The fish life is most abundant at shallow depths, including several varieties of rarely seen juvenile fish that take refuge around Cape Kri. At certain times of the year, multiple species spawn, and a thick, shimmering blanket of silversides and baitfish cover the reef. Exploring these awesome sites during the spawning season is like plunging off the edge of the known world, and perhaps that's why the Raja Ampat Islands are being touted as tropical diving's final frontier. A trip here could be your best opportunity to get up close and personal with a place the rest of the world hardly knows. **SD**

GET THERE ➤ For more information about the Raja Ampat Islands, turn to In Depth, page 101, section 4.



THE BEST WEIGHT-INTEGRATED BCs

SCUBALAB REVIEWS
11 MODELS
TO SEE WHICH ONES CAN
CARRY THE LOAD.

THESE DAYS, WE'VE GOT TVs IN OUR SUVS and cameras in our cell phones, so why not ballast in our BCs?

Look around any dive resort you visit, or any dive boat you board, and you'll find more and more divers using BCs with integrated weight systems. The 11 models reviewed here—seven back-buoyancy, two jacket-style and two hybrid designs—represent the latest thinking in the best way to combine your weight belt with your BC.

BY JOHN BRUMM



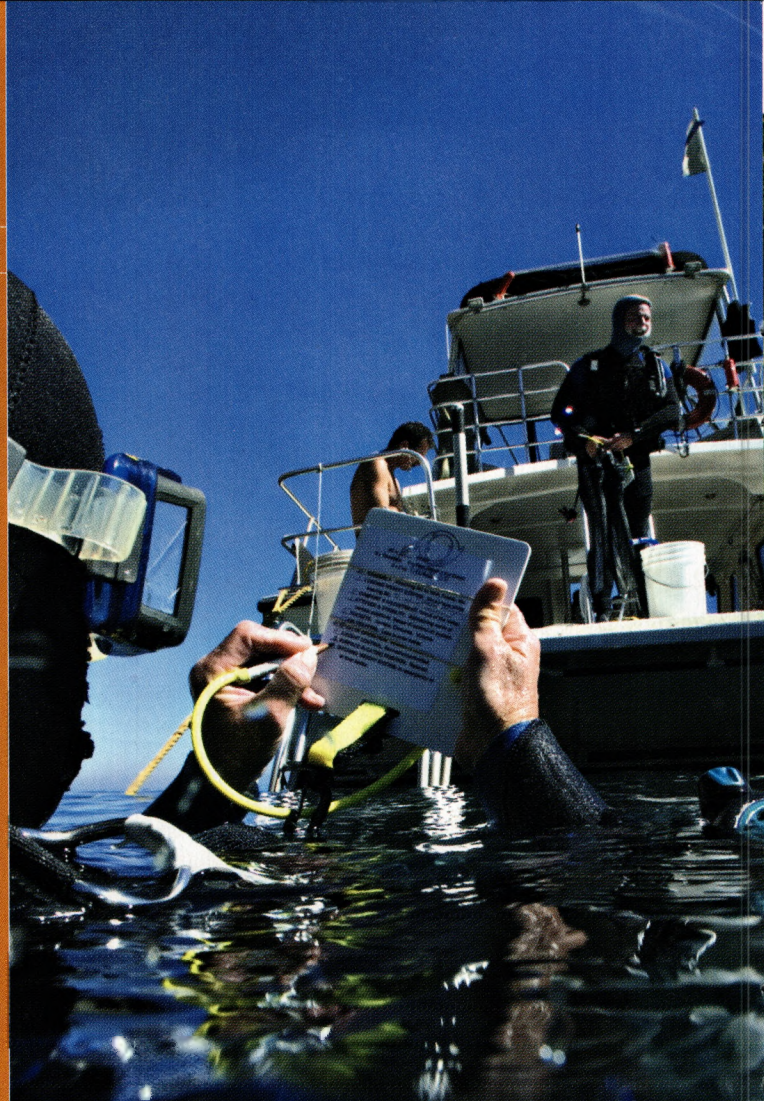
THE TEST REGIMEN

In addition to all the usual functions of a typical BC, weight-integrated models have to securely hold and—on demand—easily ditch the weight they carry. To accomplish this, manufacturers offer an array of ballast pouch designs with a variety of mechanical and Velcro release systems. And as we found in our tests, some clearly work better than others.

To test these BCs, we started with objective evaluations conducted by ScubaLab staff in a dive training pool. We deflated each of the BCs and measured them for inherent buoyancy (ideally, your BC should have little to no inherent buoyancy), then inflated and measured them for buoyant lift to see how much variance there was from the manufacturer's claims (see "A Word About Buoyant Lift," pg. 71). Then we tested the flow rates of the inflate and deflate valves. Our goal: To see if the deflation rate exceeds the inflation rate. The reason: If the inflation valve sticks open, you can still control your ascent if you can dump air faster than it's being added. You'll find the results of all these tests in the charts on pg. 100.

Then came the ergonomic tests, performed in a real-world ocean environment by a team of experienced divers—two-thirds male, one-third female, ranging in age from their mid-20s to late 50s. We loaded the BCs and our test team onto the dive boat *Island Time* and transported them to Catalina Island, where we spent four days in the water focusing on a range of BC functions, from the highly critical ascent control and stability at depth, to valve operation, the ease and efficiency of the weight ditch system and, of course, comfort. Also noted were a number of convenience elements including the ease of assembly and the use and accessibility of pockets and attachments. You'll find these scores in the ergonomics chart.

When all tests were completed, we crunched the data and found four models at the top of the pack, followed closely by a number of very good performers.

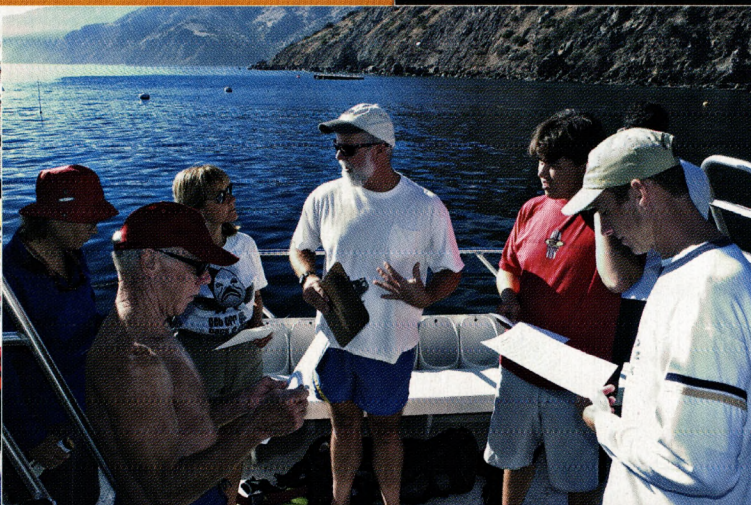


DEFINING OUR TERMS

When you see the word *excellent*, *very good*, *good*, *fair* or *poor* in bold, it represents a numeric score on a five-point scale that encapsulates the results of our tests. For additional details, see the chart on pg. 100. (5-Excellent; 4-Very Good; 3-Good; 2-Fair; 1-Poor).



Gear check.



ScubaLab director John Brumm briefing the test team.



A tester hits the water.

THE TESTERS' CHOICES

THE CREAM OF THE CROP. These four BCs earned more performance points than their competitors, with the Oceanic Probe QLR, Aerie Atmos XT and Mares Vi MRS delivering the best combined scores in ascent control, stability and valve operation, while the DeepOutdoors Matrix Standard led the pack in comfort and with its weight ditch system. All boast little to no inherent buoyancy, and two earned perfect scores for their flow rates.

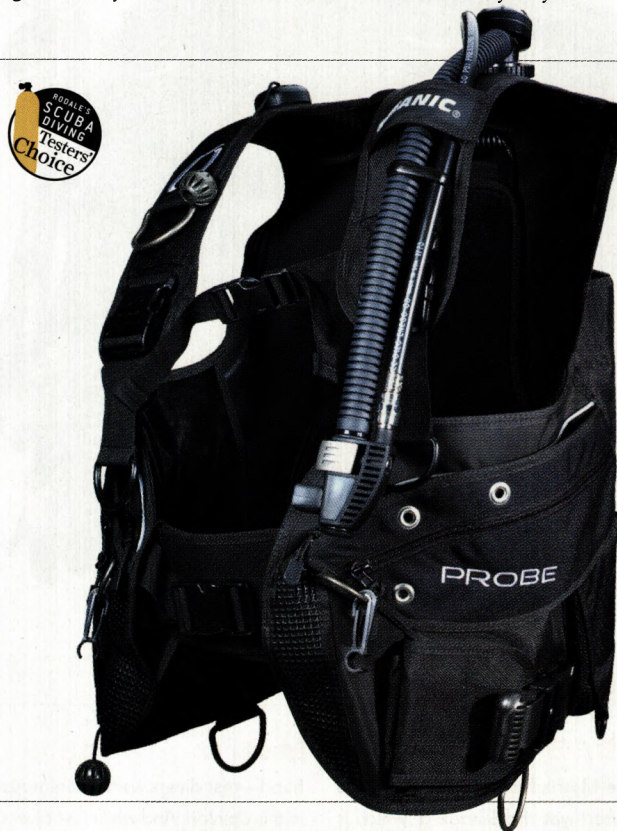
OCEANIC Probe QLR

This redesigned jacket-style BC from Oceanic earns the top spot in this year's test. The new Probe provides more buoyant lift than its predecessor, and is now equipped with Oceanic's Quick Lock Release mechanical weight ditch system. Also new: The BC's two large primary pockets now have zippers, plus a couple of accessory pockets have been added.

In our objective tests, the Probe QLR registered zero inherent buoyancy (one of only three models in this test to do so), and scored three out of a possible three on the flow rate tests. In the ergonomic tests, our divers said this BC "fits like a glove," and it earned **very good** marks for stability, both under water

and while floating on the surface. They also scored it **very good** for ascent control and praised the low-profile power inflator that allows you to inflate and deflate without changing hand position.

Constructed of 1,600-denier nylon, the Probe QLR provides velour-covered padding on the back and lumbar region and additional velour around the waist to improve comfort. The molded plastic carry handle simplifies handling, although the BC doesn't have a tank positioning strap. Built-in attachment points allow you to install an optional knife or retractor, and for tech-oriented divers, the Probe QLR can be adapted to handle double tanks.



AERIS Atmos XT

A hybrid design, the Atmos XT combines back buoyancy with an air cell that wraps under the arms. According to Aerie, the design provides better body orientation under water and an effortless upright surface position when fully inflated. According to our test divers, Aerie got it right. They rated the Atmos XT **very good** for stability at depth, and said the BC offers a comfortable surface floating position.

This model has a streamlined feel to it—there's no sense of clutter in the chest area. A soft pad cushions the back and lumbar regions, and there's a nice molded plastic handle for hefting the BC from car trunk to boat deck. The Atmos we tested came with a detachable pocket you can posi-

tion on either the left or right side of the cummerbund. Or you can use the attachment hardware to mount an optional knife.

The Atmos XT's integrated weight system uses mechanical security clips backed by Velcro. The vertically positioned weight pouches load and ditch efficiently. In the water, the BC has negligible inherent buoyancy (just over a pound), and it earned a best-possible score of three out of three for its airflow system. Test divers scored the Atmos XT **very good** for both ascent control and valve operation; they loved the efficiency of the right shoulder exhaust valve, as well as the user-friendliness of the power inflator. At a suggested retail price of \$469.95, it's also a Best Buy.



THE TESTERS' CHOICES



MARES V1 MRS

The Mares V1 is a classic jacket-style BC that uses Mares' unique MRS integrated weight system. In previous tests of Mares BCs, ScubaLab found the MRS system sloppy, hard to load and difficult to ditch. However, on the streamlined V1, the MRS is much more efficient. The plastic plugs on the removable weight pouches find their way into the plastic tracks in the BC pouch sleeves without any coaxing. Having less play in the pouch sleeves also makes ditching the weights much easier than in the past. Because the streamlined BC sleeves don't bag out, you can easily depress the release buttons on the plastic handles, pull out on the handles and slide the weight pouches from the sleeves in one fluid motion.

Test divers found the V1 to be

a comfortable, snug-fitting BC with nice padding on the back and lumbar area and a soft carry handle that can double as a tank positioning strap. They rated it **very good** on pocket placement and accessibility, although the pockets would benefit from a bottom pleat to increase volume. Test divers also rated the V1 **very good** for stability, both at depth and on the surface, and found the power inflator to be very comfortable in the hand, with easy access to control buttons.

In the objective flow rate tests, two out of three deflate methods available in a heads-up position were able to keep ahead of the inflator, and the V1 registered less than a pound of inherent buoyancy. With a suggested retail price of \$479, it's also a Best Buy in this test group.

DEEPOUTDOORS Matrix Standard

The Matrix back-buoyancy BC we tested was the Standard, which is more suited to recreational diving than the Custom version, but it's still pretty "techy." The Standard uses double waist straps with a big stainless steel buckle and sports lots of stainless steel D-rings. There's a thick lumbar pad for comfort, contoured shoulders, a trapezoidal strap system and removable crotch strap for fit, and huge ditchable weight pouches that will hold up to 40 pounds of ballast. The Matrix is twin-tank adaptable and can be equipped with optional stainless steel backplate, stowage pockets and trim pouches.

A unique feature of this BC is a cordura sleeve that keeps the low-pressure inflator hose joined to the corrugated hose. The power inflator pumps a lot of air fast, but its old-style design feels clunky in the

hand—test divers were unanimous in this opinion. And while test divers said holding the corrugated hose overhead vented air fast enough to control ascent, they found the pull dump to be extremely slow during the ergo tests. This was borne out by the objective flow rate tests.

However, test divers rated the Matrix one of the most comfortable BCs in this test go-round, and one of the most stable at depth. The Matrix was one of only two BCs to earn an **excellent** score for weight ditching, and one of only a handful of BCs rated **very good** for the ease of loading weights. Both scores reflect the ample size of the weight pouch sleeves as well as the pouches themselves. Also, the pouch handles are easy to grasp, and the triple-flap Velcro system holds weights secure but isn't too grabby when it comes time to ditch.



WEIGHT DITCHING

Q & A

Which is better:
Velcro or mechanical systems?

A: When last we looked at weight-integrated BCs as a category, more than 70 percent of the BCs reviewed used Velcro security systems to prevent their weight pouches from ditching accidentally. This year, over 80 percent of BCs reviewed use mechanical security systems (although some of these use a bit of Velcro as back-up). This trend suggests that the majority of manufacturers have come to prefer the decisive click of a mechanical buckle when it comes to securing weight systems. However, don't discount Velcro systems: of the two BCs earning *excellent* scores for their integrated weight systems, the SeaQuest Fusion is mechanical, and the DeepOutdoors Matrix is, you guessed it, Velcro.

Which is better: Hard or soft weights?

A: Although a number of BC owners' manuals recommend using soft weights in their weight pouches, it turns out soft weights can be a problem for some BC systems.

Soft weights tend to work well in streamlined, contoured pouches that force soft weights to mold to—and then maintain—the shape of the pouch. But pouches that are too roomy, or that don't form fit against a diver's body, can allow soft weights to bunch up and settle in the bottom of the pouch like a lead blob, which can cause problems when it comes time to ditch. Granted, hard weights aren't as comfortable as soft weights, but they are often easier to load into pouches. They also allow the weight pouches to load easier into BC sleeves, and, because they tend to present a thinner profile in the pouch, they ditch more easily.

Should I load weights before or after
I put the BC on?

A: Loading before you put on the BC can be easier, but then you have to lift a lot more weight onto your back. Of course, depend-

ing on what BC you're wearing, loading weights after you put on your BC can range from easy-as-pie to downright difficult. Which way is best? It depends on who you ask. Either way, it doesn't hurt to get a little help from friends. If you load beforehand, your buddy can help you with the hefting. If you load afterward, your buddy can help you stuff pouches and make sure they're properly secured. Whether you load your BC before or after, fully deflate the bladder before inserting the pouches. And if you load while wearing the BC, pouches will often load into sleeves more easily if the cummerbund is unhooked.

JAY IRELAND/
BRADLEYIRELAND.COM



DEFINING FLOW RATES

THIS IS HOW WE NOW TEST FOR FLOW RATES. In a heads-up ascent position, with the BC totally empty, at a depth of approximately 14 feet, the inflation valve is simultaneously activated for 20 seconds along with an applicable deflate valve (those located in the shoulder areas, or the highest valve on the BC while in a heads-up ascent position) to determine whether deflation can stay ahead of inflation. After 20 seconds, we note the results, and then immediately move to the next applicable valve and repeat the process.

BCs are scored for whether or not each exhaust valve can stay ahead of the power inflator. It's as simple as that. However, the number of exhaust valves that can stay ahead of the power inflator while in an ascent position is also noted. The way we see it, the more the better (see chart, p. 100).

A WORD ABOUT BUOYANT LIFT

SOME WEIGHT-INTEGRATED BCs TESTED here are capable of being loaded with weight exceeding their total buoyant lift, especially in the smaller sizes. If you're a warm-water diver who wears minimal exposure protection and therefore needs little ballast weight, this is of little concern. However, if you dive with a thick wetsuit or dry suit with substantial ballast requirements, then you'd better make sure your BC has enough lift.

Past ScubaLab tests have determined that a BC should provide enough buoyant lift to allow you to achieve neutral buoyancy at no more than 50 percent of its full inflation, under the most demanding conditions, i.e., maximum depth with maximum suit compression. This way you have a buoyancy reserve in case of emergencies.

For this reason, we also test manufacturer claims of buoyant lift. In this group of BCs, we once again found that the buoyant lift of some models varies considerably from what's stated in the owner's manual (see chart, p. 100).

LOOKING FOR MORE?

TO SEE PREVIOUS SCUBALAB REVIEWS of weight-integrated BCs, go to the GearFinder section of www.scubadiving.com.

VERY GOOD PERFORMERS

WHILE THEY DIDN'T COLLECT quite enough points to earn Testers' Choice designations, these four BCs are nevertheless top performers. With one exception, performance in the critical ergonomic areas of ascent control and stability ranges from **good** to **very good**, and, again with one exception, performance in important areas like valve operation and weight ditching ranges from **good** to **excellent**.



TUSA Imprex Pro Cubic

Designed for the more advanced diver, the Imprex Pro Cubic is a back-buoyancy BC sporting a high-lift bladder. Tusa's Independent Harness and Waist Support systems provide lots of adjustment for varying body shapes. The BC has a 1,000 denier shell, contoured shoulder straps and a backpack with rigid nonskid runners to support the tank. The weight ditch system secures with Velcro flaps. For storage, there's a large mesh bag that deploys easily and can be unclipped from the BC.

In the water, the Imprex Pro Cubic earned **very good** scores from test divers for stability. They also found the BC provides a comfortable surface floating position when partially inflated. Awarding another **very good** rating for valve operation, test divers found the power inflator to be very user-friendly, with remote valves easy to access and activate. This BC scored three out of a possible three in the valve flow tests, and registered just over two pounds of inherent buoyancy.



SEAQUEST Fusion

The Fusion's hybrid design positions buoyancy between the tank and diver and under the arms. It's a winning combination—the Fusion scored **very good** for stability both at depth and on the surface. It also rated **very good** for comfort thanks to its shoulder swivel buckles, trapezoid strap system and abundant padding.

With a power inflator that attaches just below the left weight pouch, the Fusion eliminates the traditional corrugated hose. You deflate the BC from two lower rear exhaust valves or a right shoulder valve. On a standard heads-up ascent, this system may require two hands—the left to operate the inflate button, and the right to operate the shoulder exhaust valve. Test divers gave it only a **fair** score for ascent control.

The Fusion's Sure Lock mechanical weight release system, however, earned an **excellent** score for ditching and a **very good** for loading, thanks to weight pouches that snap securely into place but ditch with just a tug.



SHERWOOD SCUBA Outback

The Outback is a rugged back-buoyancy BC designed for advanced or technical divers. It has a heavy-duty harness with no padding to speak of, and one-time screw-down adjustments on the cummerbund and shoulders to customize fit. It has lots of stainless steel D-rings and can be rigged for twin tanks. In its standard form, it is fitted with the Mini-Pac, a semi-hard backpack that offers both stability and comfort. There's an adjustable sternum strap for a dry suit chest valve.

The BC uses Sherwood's CQR mechanical weight ditch system. Test divers rated it **very good** for weight ditching, but said the loading phase was only **fair**, due to the difficulty in clipping the security buckles while wearing the BC. The solution is either to load the BC prior to donning or get a buddy's help. The Outback has just one pound of inherent buoyancy, and its two shoulder-mounted deflate methods easily keep pace with inflation. At \$320, the Outback is a Best Buy.



DACOR Falcon

Simplicity is key with Dacor's lightweight, back-buoyancy Falcon. The BC uses a waist buckle instead of a cummerbund and has a rigid but comfortable backpack. The harness has swivel shoulder buckles to improve strap routing, a neoprene collar and under-shoulder padding.

The Pocket Lock weight system, using squeeze buckles backed by Velcro, got mixed reviews. Although the system earned **very good** scores for easy loading, the spacious pouches caused ballast to shift. And while weights can technically be ditched in a one-step motion (ignore the handles, squeeze the buckles, grab the female portions and yank), real-world use mandates two steps (one to unclip the buckles and another to pull the handles), which resulted in only **fair** scores for ditching. Test divers did like the streamlined power inflator, which contributed to **very good** scores for valve operation. The Falcon registers less than a pound of inherent buoyancy and sports an efficient pull dump.

GOOD PERFORMERS

THESE ARE SOLID, NO-NONSENSE BCS that offer respectable across-the-board performance. While sharing the dubious distinction of having under-performing pull dump valves—which contributed to **fair** ascent control ratings in two of the three—in most other tests these BCs delivered **good** to **very good** performance.



DUI Delta Wings

With a high-lift bladder, high-load weight system, heavy-duty D-rings and snappy retractor system, the Delta Wings may be better-suited to tech divers than rec divers. This one-size-fits-all BC successfully incorporates straps and one-time adjustments to allow virtually any diver to find the perfect fit. The model we tested was able to accommodate all test divers, from 6'2", 190-pound males to 5'2", 105-pound females, who as a group rated it **very good** for assembly as well as for fit and comfort.

However, test divers found ascent control to be a challenge, rating it only **fair** due primarily to a bulky old-style power inflator and an inefficient pull dump. While awkward in the hand, the power inflator does pump air forcefully, and the deflator button vents air efficiently when held overhead.

The Delta Wings registers no inherent buoyancy, and the weight system's huge pouches load and ditch weight easily. However, the BC has no trim pouches or storage pockets.



INTERNATIONAL DIVERS Advantage

The redesigned back-buoyancy Advantage comes in three models: a heavy-duty version for technical divers, a standard version for recreational divers and a stripped-down version for travel divers. We tested the standard version, which is a much simpler design than the original Advantage with zero inherent buoyancy, fewer straps, a more user-friendly harness, improved ergonomics on its power inflator and a much better weight system.

While easier to assemble and adjust than the original, the new Advantage earned only **fair** scores for comfort. Test divers found the weight pouch/cummerbund system bulky and cumbersome and out of proportion with the BC's other adjustments. Also, the stiff web overstrap on the waist was difficult to adjust. Finally, the top tank strap was positioned so high on the backpack that test divers found it difficult to position the BC on the tank so that the tank yoke and regulator first stage wouldn't hit the back of their heads.



OCEAN MASTER Knight Pro

The back-buoyancy Knight Pro has a unique gel-filled pad to cushion the back and lumbar region, and the gel-padded under-shoulders are textured to reduce slippage. Combined with an efficient strap system, the BC provides a comfortable, supportive fit at depth. The BC could use a handle as well as a tank positioning strap.

The power inflator comes with an emergency horn as standard equipment. The horn is effective, but it tends to clutter up the inflator housing, making it too bulky for small hands and too busy for others, contributing to a **fair** score for valve operation. This, combined with an inefficient pull dump valve, also made it more difficult for test divers to maintain ascent control, resulting in an additional **fair** rating in that critical category.

However, test divers rated the one-step mechanical integrated weight system as **good** for weight loading and **very good** for weight ditching. The Knight Pro has five pounds of inherent buoyancy, the highest in this test group.

FOR MORE INFO

AERIS
www.diveaeris.com

DACOR
www.divedacor.com

DEEPOUTDOORS
www.deepoutdoors.com

DIVERS UNLIMITED INTL.
www.dui-online.com

INTERNATIONAL DIVERS
www.internationaldivers.com

MARES
www.mares.com

OCEAN MASTER
www.oceanmaster.com

OCEANIC
www.oceanwww.com

SEAQUEST
www.sea-quest.com

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LESSONS FOR

Life

By Michael Ange

(DIVE ACCIDENTS, CLOSE CALLS
& HOW YOU CAN AVOID THEM)

FILE :

70

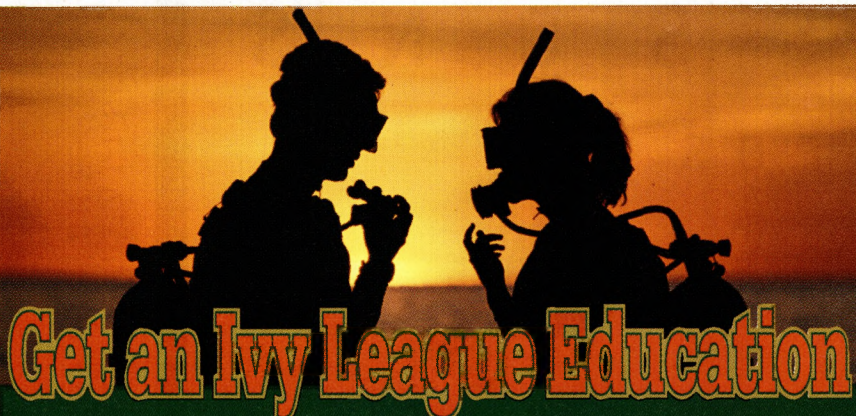
#

(THIS IS A TRUE STORY,
BUT THE NAMES HAVE
BEEN CHANGED.)

SPEED KILLS

In a hurry to be the first person on the wreck, an experienced diver makes a rookie mistake that costs him his life.

MARK SPLASHED INTO THE WATER, enjoying the cool embrace. It was a welcome change after the sweltering heat of the boat deck, and he was eager to be first on the wreck below. His BC was deflated, and the weight of his double tanks pulled him rapidly downward. He rolled over to a proper swimming position and touched the inflator to slow his descent. Then his regulator quit breathing. Switching to his backup, he got two short breaths before it stopped delivering air, too. Realizing his error, he attempted to reach behind his head for the tank valves as he sank to the ocean's bottom. Unable to reach them, he struggled to loosen



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the straps of his BC as he continued to drop deeper.

THE DIVER

Mark was an experienced technical diver and a recreational instructor with a significant number of dives at depths well in excess of 100 feet. He was in his late 30s and in excellent physical condition.

THE DIVE

Seas were calm as the charter boat departed for a popular wreck off the North Carolina coast. Even though the dive was only slightly deeper than 100 feet, Mark chose to use his familiar technical gear setup because of the security offered by the added gas supply.

On the two-hour commute to the wreck, Mark and his dive buddy discussed their plan to collect artifacts. When they were 10 minutes from the wreck, Mark rapidly climbed into his wetsuit and began strapping on gear. The crew dropped anchor, but missed the wreck on their first pass. Covered in neoprene and weighted down by his gear, Mark sat in the sun and sweltering heat, longing to enter the water. As soon as the wreck was hooked, he was the first to the entry door. With a quick wave to the mate, he fell backward into the water.

THE ACCIDENT

By design, Mark entered the water with his BC deflated to allow the weight of the gear to pull him into a rapid descent. He and his buddy planned to meet under the boat between 15 and 30 feet to complete a fast gear check. It was a practice they had repeated on a number of previous technical dives.

By the time Mark's buddy

entered the water, Mark had already descended well past the pre-arranged check depth. Although visibility was good, the buddy was unable to locate Mark upon reaching the wreck. He searched for a few moments before ascending with the assumption that Mark had surfaced due to some type of equipment problem.

In Mark's haste to get into his equipment, he failed to turn on either of his two tank valves—an error that could have been corrected on the surface had he not been in such a hurry, or during the check stop had he not been descending so fast. Mark was unable to get his air turned on in the water, and his body was recovered from the bottom just a few yards down current from the wreck. His BC straps were partially removed and his backup regulator was clenched tightly in his mouth, but the recovering divers noticed that neither regulator was capable of delivering air.

ANALYSIS

Although witnesses—including Mark's buddy—were certain they saw Mark check his submersible pressure gauge, it's likely that he was only reading residual pressure left in the breathing system from his initial gear setup at the dock. After pressurizing his system to check for leaks, Mark would have turned the air off for the two-hour boat ride. In his rush to suit up, Mark failed to turn the cylinders back on before entering the water.

The residual pressure in each of the regulators would have allowed Mark a few breaths as he sank to the bottom. However, his attempt to inflate his BC and slow his descent would have robbed him of some of that breathing gas.

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A rapid descent is not uncommon for technical divers; however, Mark sank too rapidly to meet up with his buddy for the vital in-water equipment check. This drill, usually conducted at 15 feet or less, is a standard safety procedure for technical divers.

Another issue, which will remain unexplained, is why Mark was unable to reach his tank valves. The ability to turn these valves on and off is a standard skill for technical and recreational divers. It appears as though Mark's inability to perform this basic skill, coupled with his failure to properly check his equipment, cost him his life. **SD**

LESSONS FOR LIFE

1 BASIC WATER SKILLS are not simply training exercises; they're lifesaving functions and should be practiced routinely.

2 DIVERS SHOULD ALWAYS perform a complete check of equipment before leaving the boat—even if it was checked at the dock. To ensure proper regulator function, take two or three deep breaths on your second stage while watching your pressure gauge. If the tank is turned off, or if the valve is not opened completely, the indicated pressure will drop.

3 SPEED KILLS. The ultimate issue leading to this tragedy was Mark's rushed entry in order to seek potential artifacts from the wreck. Always take time to check your equipment, to have a proper plan and to conduct the plan safely. Nothing on the bottom is worth dying for; however, this particular set of circumstances, referred to by experienced wreck divers as "brass fever," has led to numerous fatalities through stupid mistakes.



Stop. Breathe. Think. Only then should you act.
Rushing into a rescue can make you both victims.

SAFETY, SKILLS & MORE BOTTOM TIME

Training

INSTRUCTION

Confidence Course

How one diver went from zero to hero, thanks to Rescue Diver training.

BY JOHN FRANCIS

HIS MASK PUSHED BACK, his reg out of his mouth, the victim flails the surface with his arms, staring wildly in all directions. "Diver!" I call out. "Are you in trouble? I can help you!"

No answer, no eye contact. Clearly, this guy is in panic. I approach cautiously and stop outside his reach, as I've been taught. A panicky diver only wants to climb out of the water, and he'll crawl up your chest and stand on your head if he can. The cardinal rule of rescue is to save yourself first; otherwise, there will be two victims.

To take control of this diver, I'll need to get behind him and grip his tank between my



and reach the surface, gasping.

"Are you all right?" instructor Ned Branch calls from poolside.

"Yeah, I'm OK, but he can drown now."

That earns a rueful laugh from my "victim," Joe Martin, a skilled divemaster in danger of nothing more than overacting. Joe then confirms my mistake: I should have waited. "I was about beat when you approached," he says. "I would have had to quit thrashing in another minute."

Stress and Panic

THIS WAS MY MOST vivid lesson in the first full day of a Rescue Diver course I took recently in Southern California. It started with classroom work last night and will finish with two full days in the ocean. Before it's over, I will drown at least two of the "victims" I'm trying to save, but emerge feeling more confident in my dive skills than I have in

each until we get it right, then add another. Running through each drill is a common thread; besides meeting the victim's immediate need (for air, a tow), we have to treat what's almost always his real problem: too much stress.

Stress has physical causes ("I'm cold, I'm tired") and psychological causes ("I'm confused, I'm worried") that can feed one another and grow to anxiety and then panic if not controlled. Many dive emergencies, like avalanches, start with a minor problem—a leaky mask, say, or a sticky power inflator. The minor problem causes stress, which impairs judgment, which leads to a bigger problem, more stress, worse judgment, and so on.

A major goal of the rescue diver is to stop the avalanche to disaster early, before it gains power and speed, by reducing and managing stress. And stress, as I found out, attacks both victims and rescuers.

Solution Thinking

THE RESCUE DIVER COURSE teaches that the best medicine for stress is what Ned calls "solution thinking." Basically, it's the

A major goal of the rescue diver is to stop the avalanche to disaster early, before it gains power and speed.

knees, then give him buoyancy—inflate his BC or dump his weights. If the victim were smaller, I might try grabbing an arm and spinning him around to get to his tank, but this guy is huge, a man-mountain churning the water around him into Class 5 rapids. So I submerge to approach from below and behind, because whatever else happens, a panicky diver won't go deeper to grab me.

This is my first mistake. The victim is on the surface and breathing, and I should wait for him to calm down through exhaustion. But his alarm is infectious and I feel the need to do something now.

Under water, the victim is invisible in a roiling cloud of bubbles. I approach and suddenly my head is smacked backward, my mask and reg wiped off my face. Instead of his tank, I've found one of the victim's massive pumping knees. I push off

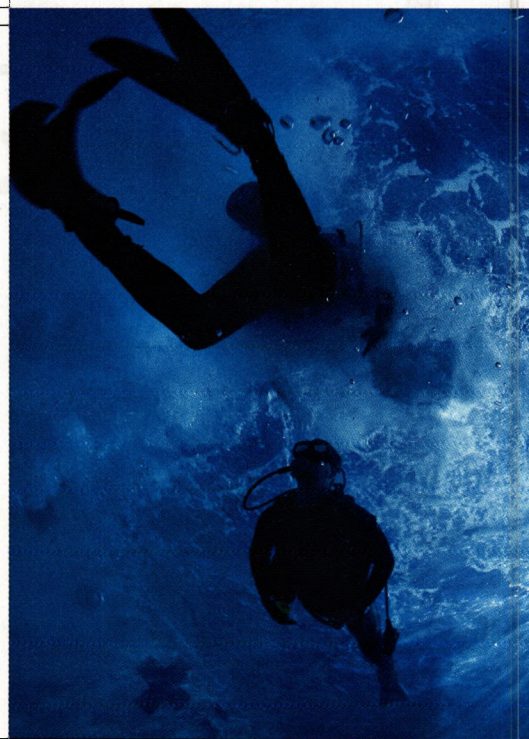
23 years of diving.

My fellow students are new divers looking to improve their skills. Two, Jason Hoge and Ryan Chromy, have 18 dives each in their log books. Carr Brown has 50. All of them see the rescue course as basic skill development.

Me? As training editor for *Scuba Diving* with oh-so-many dives behind me, I've covered this material many times before, so the class should be easy. Or so I think.

The classroom sessions covered how to assess an emergency, organize a rescue effort, treat for drowning and administer oxygen for DCI, among other things (independent first aid and CPR certification will be required before we finish the course).

Then we hit the pool at Ventura Dive and Sport and practice skills like towing a tired diver and air-sharing. We practice



classic formula: Stop. Breathe. Think. Act. "You've got to break the instinctive fight-or-flight response, because your instinctive reaction is usually the wrong reaction," he says. "The first thing to do is stop."

The next step, taking a slow, deep breath, also requires no thinking. Both steps calm you down, allowing your brain to engage for step three, thinking through a rational course of action. Only then do you act. "Solution thinking doesn't start with 'Act,' it ends with it," Ned explains.

For our next pool drill, something new. Suppose you see a diver lying face-down on the bottom, not moving. What should you do?

First, Ned says, nudge him to make sure he's really unconscious. If he doesn't respond, you need to get him to the surface before you can do anything else. The basic consideration is to keep his reg in his mouth if it's still there (don't waste time fumbling for it if it's not) and ascend at a normal rate. Assuming he's lying on the bottom on his stomach, approach his left side, put your right arm under his left armpit, reach for his reg and hold it in place

while also supporting his head in a normal position so expanding air can escape from his lungs. That leaves your left hand free to vent your BC and, if necessary, the victim's BC. But if the victim gets uncontrollably buoyant, let him go to the surface alone and ascend safely yourself. Michelle Tomillo acts as my "victim" this time and all goes pretty well. My confidence soars, just in time to for me to commit another homicide.

The Kiss of Death

ONCE YOU'VE BROUGHT the victim to the surface you'll need to decide if he's breathing and, if he's not, give artificial respiration. Likewise, if you just happen across an unresponsive diver floating at the surface. That's our next exercise.

Four volunteers act the parts of unconscious victims lying on the surface, face-down. We students are supposed to approach, calling "Diver! Are you in trouble?" and splashing water at our victim to verify that he is unconscious. If he doesn't respond, we call out "Diver needs help!" then turn our victim onto his back, check for breathing and give artificial respiration

by both mouth-to-mouth and mouth-to-pocket-mask methods. Each student gets a victim. Joe—massive, a sleeping whale—is mine again.

To roll a face-down victim onto his back, you approach him head-to-head with your arms crossed. Grab the victim's wrists, and by uncrossing your arms you should be able to roll him over. That's what the book says, anyway. But Joe's arms are spread so far I can't reach both his wrists with my arms crossed. Somehow I capsize him. Next: My weight belt off, victim's weight belt off. My mask off, victim's mask off. My reg out, victim's reg out. My hood off, then support his head to open his airway and look, listen and feel for breath on my cheek. No problem so far.

Now the hard part. Mouth-to-mouth is sometimes called "the kiss of life," but the victims—especially the guys—had warned us to not take that literally (the least necessary instruction of the day). Instead, we would simulate mouth-to-mouth by breathing into the back of the hand that pinches the victim's nose. First, two long breaths, then one every five seconds.

10 TRICKS I LEARNED IN RESCUE CLASS

1. When towing a tired diver, ask him to help by finning a little, even if you don't need the help. By making him a co-rescuer instead of a helpless victim, you may restore his confidence and head off stress.
2. As you approach a surfaced diver looking distressed, asking a question like "Are you OK?" gives a clue to his state of mind. If he doesn't answer or if he acts like he didn't hear, he may be approaching panic.
3. Say, "I can help" as you approach. The words give surprising comfort to a panicky diver.

4. If a panicky diver on the surface rushes toward you, back up toward the boat or shore. That leads him closer to safety.
5. The best first aid for a tired diver at the surface is more buoyancy. Fatigue means stress and fear of sinking, and he may be closer to panic than either of you realizes. If he inflates his BC or dumps his weights (or you do it for him), he'll relax almost instantly.
6. While towing a tired diver, keep up the cheery, optimistic chat ("We're doing great, we're almost there," etc.) to keep

down his anxiety level. Make eye contact if you can.

7. Finally, there's a use for a snorkel: extend it, instead of your hand, to a tired, panicky diver. If he takes it in a death grip, you can let go if you have to.

8. After passing your octopus to a diver who's low on air, don't start ascending immediately. Pause a moment for both of you to establish a breathing rhythm, get used to the situation, make sure you've got a grip on each other (with right hands) and calm down. Only then start up.

9. Giving one rescue breath

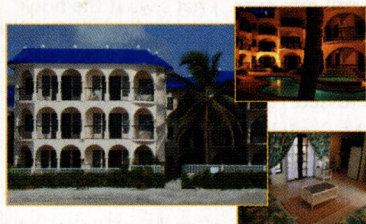
every five seconds means counting to "one thousand four," not five, between them. You're giving the breath on "five."

10. "Bounce" an unconscious or helpless diver to get him onto the dive platform. First, dump all his gear. Put one of his hands on the edge of the platform, the other on top of the first, and one of your hands on top of both to hold them there. Climb out yourself, then grab his wrists and bounce him up and down in the water, higher and higher. At the top of a bounce, jerk him onto the platform.



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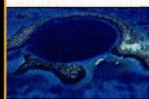
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INSTRUCTION

The drill calls for the rescuer, who's on one side of the victim, to reach under him with the hand nearest the victim's feet and support his head with it, while his other hand reaches over the victim's head to pinch his nose. For example, if you're on the victim's right side as he floats face-up, you should reach under and support his head with your right hand while your left hand comes over his forehead and pinches his nose.

My brain understands what to do, but my hands confuse their roles twice—my right hand pinches Joe's nose while my left hand supports his head. That means the palm of my right hand smothers Joe's mouth.

Rescue breathing with a pocket mask goes even worse. I'm supposed to position myself at Joe's head, place the mask over his mouth and nose, hold it firmly in place with fingers and thumbs of both hands, then arch my head over his face and blow into the mask. I try twice, but can't get high enough over Joe's buoy-sized head. Instead, I just push him under water. It's Joe's turn to come up gasping and choking. But Ned is a patient instructor, and I get as many chances as I need to get it right.

We next add gear removal for both rescuer and victim while maintaining the rhythm of rescue breathing—one breath every five seconds. The trick here is to be patient; unfasten only one buckle or strap after each breath. That I can do, but maintaining a steady breathing rhythm at the same time is tough. Basically, I leave my "victim" to asphyxiate while I slowly unsnap buckles. And what's worse, Jason and Ryan finish long before I do. "You guys are naturals!" Ned tells them as I stumble on. I'm embarrassed, discouraged and confident of little except that I could undress a

corpse pretty well.

Tomorrow we'll repeat all these exercises in the ocean and add a few more, like searching for a missing diver and helping a tired or unconscious diver to shore. Right now, it seems impossible.

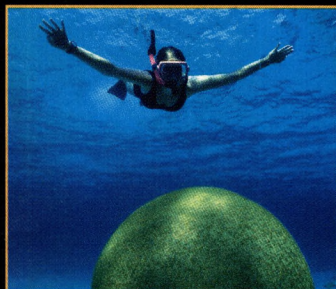
A Brighter Day

DIVING CONDITIONS off the beach the next morning aren't ideal—cold water, zero vis and a little surface chop. Ned wants us to combine several drills into one rescue sequence: we'll surface an unconscious diver, give rescue breathing and remove gear.

Given the conditions and my track record, it sounds tough, but when I begin the rescue, everything starts to go well. Somehow, overnight, my hands have learned where to go. Almost by themselves they bring Michelle to the surface, supporting her head properly. They inflate BCs, drop weights, take off regs and masks and start unbuckling our other gear. I feel relaxed now and more confident. I've stopped punishing my victims and started helping them.

I finish the class a more competent diver. Not only have I learned important skills, but I've also gained confidence that if faced with a real emergency I'd be able to help. It's a common epiphany among students in the rescue course. Ned tells me that his first rescue diver class "did more to increase my confidence level and my personal skills level than virtually any other course since I got certified."

Then he asked me to consider the alternative. "What if somebody were in trouble and you could have helped but didn't know how? How are you going to deal with that for the rest of your life?" **SD**

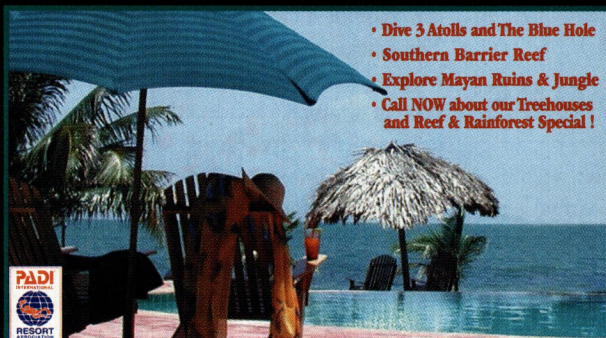


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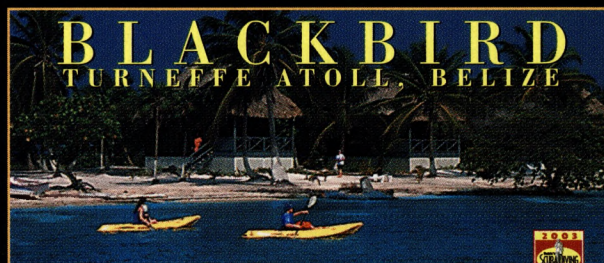
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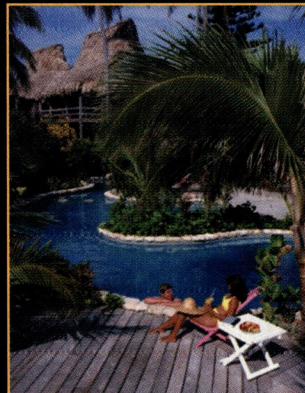
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Five Things You Can Learn from Tech Divers

Dive longer, deeper and safer with their techniques. BY
MICHAEL ANGE

THE NEXT TIME you see divers suiting up with double tanks and redundant computers, pay closer attention. Even if you never plan to explore beyond traditional recreational diving limits, there's a lot you can learn from tech divers. In the quest to dive deeper, longer, farther

and—most importantly—safer, technical divers have become the virtual test pilots of scuba. Here are five things recreational divers can learn from their technical cousins.

Learn from Your Mistakes

THE EQUIPMENT, the procedures and many of the diving rules in use today have largely been built upon technical diving's most significant contribution to the div-

ing industry: accident analysis. The cave diving community began decades ago analyzing every significant accident and compiling both primary and secondary causes of these fatalities or near fatalities. This active process of learning from mistakes—and adapting training and gear to prevent future accidents—continues today in the cave diving world, and through the assistance of some dedicated volunteers, is now expanding to all fields of technical diving.

In the recreational realm, the Divers Alert Network (DAN) compiles the annual *Report on Decompression Illness, Diving Fatalities and Project Dive Exploration*. DAN's annual review and analysis of recreational scuba injuries and deaths forensically dissects—with charts, graphs and reports—the state of dive safety. The report is free to DAN

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members at its web site, www.divers-alertnetwork.org.

Manage Your Gas Supply

TECHNICAL DIVERS HAVE long used a gas management rule called the rule of thirds. Taken literally, the rule means you use one-third of your gas supply to explore, one-third to swim back to the exit point and hold one-third of your gas in reserve for delays, emergencies and ascents. Not surprisingly, a number of the recreational agencies now teach this same rule, especially for dives deeper than 60 feet.

Slow Your Ascent Rate

THE ONGOING TREND toward slower ascent rates and deeper stops to provide a hedge against DCS has its

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DO YOU HAVE WHAT IT TAKES to be a technical diver? Are you a diver with the skills, the grit and the mental focus to go to 200 feet (or beyond) and safely return? Find out this May at Tech Diver Boot Camp.

This nine-day intensive training workshop, sponsored by Mike Ange Expeditions and Sub-Aquatic Survivor, is open to advanced recreational divers interested in moving beyond the mundane to earn certifications in Decompression Procedures, Advanced Nitrox, Extended Range and Entry-Level Trimix.

Michael Ange, technical editor of *Rodale's Scuba Diving*, will lead a team of first-rate technical instructors with one goal: To turn 16 recreational divers into qualified tech divers. They won't make you do push-ups, but they will demand your best in a physically and mentally rigorous training schedule designed to expand your understanding of diving physics and physiology, dramatically improve your water skills, and teach you the fundamentals of deep decompression diving using multiple gas mixtures.

The camp runs from May 23 to May 30 at Forty Fathom Grotto in Ocala, Fla. Tech Diver Boot Camp will be the subject of a feature story in the October 2004 issue of *Scuba Diving*. But why just read about it when you can live it? For registration and more information, visit www.sub-aquaticsurvivor.com.



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roots in technical diving. As tech divers experimented with mixed gases and sophisticated dive planning software, they began to notice safety benefits in slower ascents and deeper stops. Driven by the experience of technical divers, several recreational training agencies now advocate ascent rates as slow as 30 feet per minute and some of the more progressive recreational agencies have also modified their recommendations to include a deep stop.

NAUI led the way with its recommendation that recreational divers make a one-minute stop at half their maximum depth on dives deeper than 40 feet. In technical divers, deco stops have been shown to improve the efficiency of decompression time. For recreational divers, it is theorized that the deep stop will help prevent DCS by preventing the formation and growth of bubbles of dissolved gas. For more information on deep stops, see "One Minute to Safer Diving" in the December 2003 issue of *Rodale's Scuba Diving*, or online in the training section of www.scubadiving.com.

Breathe Something Other Than Air

NITROX CYLINDERS are now as common on dive boats as smelly wetsuits, and nearly every recreational training agency offers courses in diving with oxygen-enriched air. Quite a change from 1995 when *Skin Diver* magazine labeled nitrox the "Black Gas."

The idea of replacing some of the air in a diver's tank with oxygen in order to provide a hedge against DCS was surprisingly controversial, given its roots in scientific diving. Under Dick Rutkowski, former deputy diving coordinator at the National Oceanic and

Atmospheric Administration (NOAA), nitrox became widespread among scientific divers who needed to safely extend their bottom time in order to collect data.

When Rutkowski retired from NOAA in 1985, he founded the world's first training agency dedicated to technical diving and offered nitrox training to the public. In the process of overcoming the negative hype surrounding oxygen-enriched air, he also gave us one of his other significant contributions to diving—a now-famous quote—“Science always wins over bullshit.”

Today, basic nitrox certification is considered a purely recreational pursuit. Any open-water diver can learn to use nitrox blends of up to 40 percent to safely extend bottom time. Nitrox-compatible gear is readily available and most major dive stores offer nitrox fills and training—all thanks to the demands of tech divers.

Buy Better Gear

THE SPECIALIZED NEEDS of technical divers have led to several innova-

tions in gear. The most notable may be the back-buoyancy or wing-style BC. The stable face-down swimming position and the clean, streamlined front harness of technical BCs are now favored by thousands of traditional recreational divers.

Other examples of gear that has

crossed over include bailout bottles such as the Spare Air and EAS system. Both are essentially miniature versions of the larger stage bottles carried by technical divers. And even the octopus can arguably be traced to cave divers, who were the first to make extensive use of alternate gas delivery systems. **SD**

WHAT IS TECH DIVING?

TECHNICAL DIVING is generally defined as diving outside the realm of traditional sport diving limits. This usually means the completion of dives requiring staged decompression stops; the use of gases other than air and recreational nitrox (with 40 percent or less oxygen); the extended penetration of overhead environments like caves and wrecks; or dives deeper than 140 feet.

The inclusion of staged decompression diving is only accurate in the United States and a few other locations. In most of Europe, staged decompression diving in relatively shallow water is considered a routine recreational diving activity.

—MICHAEL ANGE

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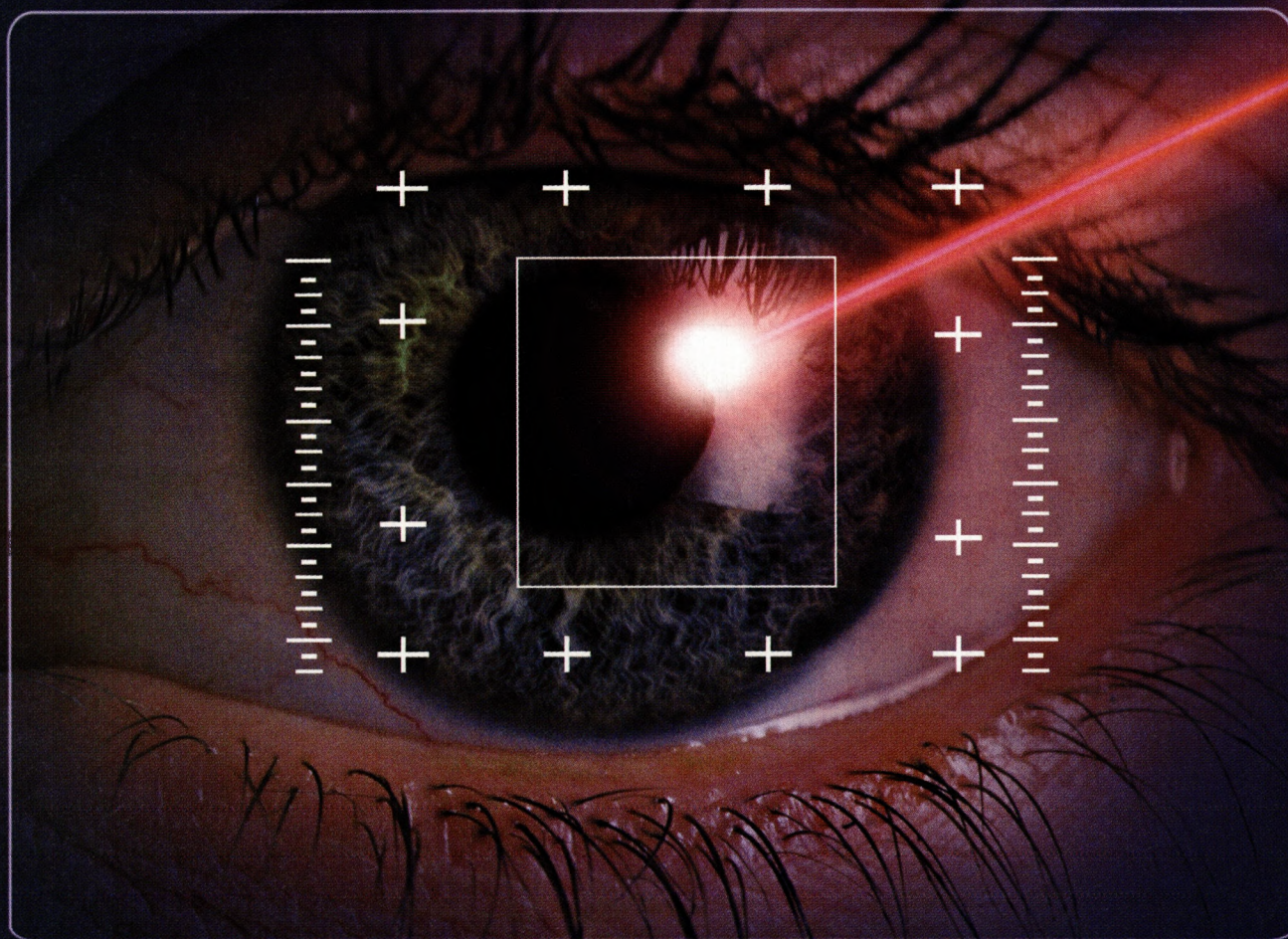
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Leave the saline at home: Lasik surgery can mean never wearing contacts under your mask again.



Visibility: 20/20

Are your dives all a blur? With the latest vision correction procedures, you won't believe your eyes. **BY SELENE YEAGER**

IF THE OCTOPUS had been any clearer, it would have been in her lap. Only it wasn't. It was a safe distance away, as was an eel,

which Dr. Helena Karlberg could also see with shocking clarity, even though the water was deep and the sky was dark. "I couldn't believe how crisp the marine life was, even at night," raves Karlberg of Houston, Texas. Day dives were even better. What once appeared as muted marine life were now brilliant parrotfish and detailed coral. "Everything had magnificent

clarity," says Karlberg.

"I've been nearsighted for years," says Karlberg. "I tried soft contacts, but they dried out my eyes, and I never saw well with them. I didn't care for glasses. So, I would often just go blurry when I wasn't working."

Then a year ago, Karlberg took up scuba. "That was the deciding factor for me to get my vision corrected. Even in good visibility, I couldn't fully appreciate the beauty of the marine environment. In poor visibility, I could barely recognize

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my buddy."

Karlberg scheduled herself for Lasik—a popular laser vision surgery. Because she also had astigmatism and large pupils, two characteristics that can make Lasik difficult, Karlberg had to have two surgeries. A few weeks after the second, she was 99 feet down in Cozumel, agape at the dazzling coral reefs with no regrets. "I just booked a trip to the Gulf. I can't wait to see the Flower Gardens."

Eye, Eye Captain

ON DRY LAND, vision accounts for about 65 to 80 percent of our perception. Fifty feet under water, where we can barely smell, hear, taste, or touch, the amount of information we depend on our eyes for increases exponentially.

"Almost 100 percent of your scuba diving experience is what you see," says Donald Teig, O.D., director of the Institute for Sports Vision in Ridgefield, Conn. At the very least, poor vision detracts from your enjoyment of the sport. At worst, it compromises your safety, Teig says, especially if you struggle to read your instruments, sight the boat or identify your buddy.

The culprit behind most vision problems is what is known as "refractive error." To see clearly, your cornea and eye lens must bend (refract) light rays so they focus on the light-sensing retina at the back of your eye. The retina transforms those rays into impulses, which it delivers to the brain, and *voilà*, fish and fauna in their crisp, candy-colored glory. When your eyeball is misshapen, the rays can't refract correctly, so the picture is distorted. The basic types of refractive error are:

Myopia > Nearsightedness, which affects about 70 million people in North America, is caused by a cornea that is too long, so only nearby objects are clear.

Hyperopia > Less common than myopia, farsightedness is caused by a cornea that is too short, leaving objects in the distance clear, but those nearby a blur.

Astigmatism > The cornea is irregularly

shaped, so vision is blurry distant and near. Astigmatism is not an uncommon condition, and many people have some degree of it.

Presbyopia > With age, the eye lens loses flexibility, making focusing on nearby objects difficult. Almost everyone develops presbyopia by age 50, which is why people wear "reading glasses." Fortunately, scuba masks magnify objects under water about 30 percent, so mild presbyopia is fairly tolerable during dives.

There are many ways to correct refractive errors, the most popular being glasses and contact lenses. Divers also can purchase special masks with prescription lenses. But not all divers are satisfied with these choices. Prescription masks can be costly and inconvenient for infrequent divers. Glasses are not compatible with splashing waves and scuba masks. And though many divers do well with contact lenses, some have trouble wearing them comfortably in the wind and water. Among these divers, there's a growing interest in new vision-correction methods like Lasik. But divers worried about the dangers of pressure, bubbles and decompression worry if Lasik surgery is safe.

The Laser and the Deep Blue See

LASIK SURGERY works like this: A special instrument cuts a thin, circular flap in your cornea. Then the surgeon holds back the flap and uses a laser to reshape your cornea. It's a quick procedure—about 10 or 15 minutes per eye; then the surgeon replaces the flap, which quickly adheres to the eyeball, no stitches necessary. Depend-

CONTACT LENS CAUTIONS

CONTACT LENSES ARE GENERALLY A SOUND, safe choice for divers. But they're not without risks. Rigid lenses can cause corneal swelling, and soft contacts are susceptible to marine bacterial infection. All kinds of contacts can be lost in the often turbulent scuba environment. For the best results, ask your doctor for a supply of soft disposable lenses. And wear sunglasses to protect your lenses from wind and water.

ing upon individual circumstances, the outcome is often 20/20 vision, though some people may still need corrective lenses or touch-up surgery. There also are potential complications (as with any procedure) that you should discuss with your surgeon. If all goes well, you can resume your normal routine within a week, though you're advised to steer clear of racket and water sports, including scuba, for a month.

All this cornea cutting and shaping leaves some divers with a lot of questions: Can water pressure or interface bubbles on the eye disrupt the flap? Are divers at increased risk for bacteria entering the eye and causing infection? Finally, are they at higher risk for a rupture of the eye from a mask squeeze?

Theoretically, all those complications are possible, but the actual risk is very low, especially if you wait at least four weeks before diving. There have been no case reports of dive-related complications since Lasik surgery was approved in the U.S. in 1996. Though it's too early to know if there are any longer-term complications, ophthalmologists are optimistic.

"Lasik surgery has been done worldwide for more than a dozen years without a hint of problems among divers," says Douglas Koch, M.D., ophthalmology professor at the Cullen Eye Institute, Baylor College of Medicine in Houston, Texas. "You equalize in the mask, so divers needn't worry about pressure once the eye heals. I've seen no problems with divers in our practice."

It is very important, however, to adhere to the post-surgery advice and stay out of the water for at least four weeks, says

Phillip Calenda, M.D., director of Westchester Vision Care in Scarsdale, N.Y. "There are particularly virulent organisms in marine environments that can cause aggressive, nasty infections," he says. Heal first, dive later.

Though Lasik surgery is improving all the time—new "Wavefront" technology that actually maps your eye is making correction more precise—it's still not for everyone. Complications like dry eyes, large pupils or other cornea aberrations can disqualify you as a candidate for surgery.

See Clearly, Flap-Free

FOR THOSE WHO CAN'T or prefer not to go under the laser, the FDA recently approved a therapeutic contact lens that corrects your vision while you

sleep, so you can see lens-free during the day. This technique, called "corneal refractive therapy" (CRT), works by flattening the surface of the cornea. After a week or two, your cornea's shape is altered similar to the way it would be following surgery, says Teig.

The procedure requires an office visit, where your eyes are mapped, analyzed and fitted for the lenses. There are also follow-up visits to ensure proper progress.

"It's a great option for divers who are reluctant to get surgery, but don't want to worry about contacts or glasses in the sand, wind and water," says Teig, who uses CRT himself and has already fitted several hundred clients. Unlike Lasik, which isn't recommended for anyone under the age of 18, CRT is fine for kids, as long as they are mature enough to

care for lenses.

As with surgical correction, pressure isn't a problem, says Teig. "The pressure isn't great enough to undo the reshaping," he says. You would need to take your lenses on dive trips, however, since the positive effects start to reverse in two or three days if you stop wearing them.

Though CRT is currently only approved for nearsightedness, researchers are studying its possible effectiveness for other types of correction. "I don't need my reading glasses anymore since I've been using them," says Teig. "That's exciting, because even surgery can't correct that yet."

To find a surgeon who can perform Lasik near you, check www.lasik-surgery.com. To learn more about corneal refractive therapy, go to www.paragonvision.com. **SD**



MIGRAINE HEADACHES

Q: During a recent open-water class I taught, a young woman developed a bad headache on the bottom at 20 feet. She went ashore with the assistant instructor and headed for migraine medication. Ten minutes later, she vomited. It turned out that she has a history of migraine headaches and takes medication to control them. As it turns out, she had a history of migraine headaches and took medication to control them. None of this was on her medical evaluation form. Later, she said her migraines are associated with exercise.

Can a migraine sufferer dive safely? Why would someone leave this information off their evaluation form?

A: Migraine headaches can be triggered by certain foods or smells, alcohol, stress, immersion in water or exertion. They can produce neurological symptoms such as visual loss and numbness, which may be indistinguishable from neurological decompression illness. Severity ranges from mild head pain to disabling discomfort with nausea and vomiting.

Some of the medicines used for migraine treatment and prevention can cause drowsiness, and could impair a diver's coordination and augment the effects of nitrogen narcosis. Each diver with migraine requires individual evaluation: While some migraine sufferers can dive safely, others may be advised against it.

Divers omit medical information for a couple of reasons. Some simply don't understand the significance an illness may have during a dive and may not want to divulge a personal medical condition. Also, experienced divers sometimes advise beginners not to report all of their medical problems in order to prevent disqualification. A new diver may be told: "I dive with migraines, and I don't have any problems, so don't bother telling anyone."

Instructors should let students know that their information is confidential and make themselves available to speak in private with divers about medical issues. Remember, the DAN medical team is always available to speak with the student, the instructor or the student's physician.

- > **DAN Dive Safety and Medical Information:** (919) 684-2948
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Going Digital

Answer a few simple questions to get yourself headed in the right direction. **TEXT AND PHOTOGRAPHY BY STEPHEN FRINK**

THE WORLD OF DIGITAL underwater photography can be confusing and more than a little intimidating to the uninitiated. Practitioners seem to speak in code, using esoteric vocabulary and indecipherable acronyms—TIFFs, JPEGs, CCDs and megapixels. And if that's not baffling enough, there's also the problem of choosing from the hundreds of competing products that are

available both at the high end and for point-and-shooters.

There is good news, however: The learning curve is a quick climb, and it's one that's well worth making. Your first step in underwater digital photography should be to examine your personal criteria.

Do you already have a digital camera?

IF SO, THERE IS a good chance it can be housed. Ikelite offers more digital camera housings than anyone else. Some of the mainstream camera manufacturers offer their own housings as well, especially Canon, Sony and Olympus. Gates Underwater Products has some excellent housings for the Sony line, and Light & Motion has long supported Olympus and Nikon. Certain Nikon Coolpix cameras can be housed by Fantasea, Sea & Sea and others. With so many options—far too many to list here—a good reference for which housings fit which cameras is found at www.digideep.com. Click on your camera preference and the site will display housing options.

Which camera should you buy?

ASSUMING YOU HAVEN'T bought the camera yet, the choice can become even more confusing, as you have to consider options such as camera features, megapixel capacity, and of course, price. Starting with a clean slate presents other options as well. Sealife Reefmaster offers a clever camera and housing system optimized for underwater photography, complete with add-on optics for both wide-angle and macro. Sea & Sea likewise offers a camera and dedicated housing (DX-3000), as well as the Aquapix, an amphibious digital camera that doesn't require a housing.

If you don't already own a camera, look at housing options first. Truthfully, I'd be hard-pressed to tell you which of

the dozens of competing viewfinder digitals offered by any of the camera manufacturers are better than the others. Most will be in the four- to five-megapixel range, offer good zoom range and

built-in flash, and most will take stills and MPEG movies. These are really pretty amazing products that continue to drop in price and add features.

Which housing should you buy?

NOW IS THE TIME for a bit of introspection. What

do you want from your digital images? Will they be snapshots?

If so, maybe a simple Plexiglas enclosure

will do the job. You'll have only the camera's built-in flash, and the housing's flat port will create refraction and make the widest zoom less wide than it would be above water. Because the built-in flash is so near the lens, if there is any particulate matter in

suspension, backscatter is inevitable. But the price should be very affordable (under \$200), and if you know how to operate your camera topside, these housings will give access to all relevant controls and make underwater operation very simple. Let's take a look at the extensive line of housings from both Olympus and Canon.

Want to grow with your underwater digital imaging? More sophisticated housings will offer the ability to use external strobes (either by hard-wired sync cord, cordless slave or fiber-optic cord), the ability to add accessory wide-angle and macro lenses, as well as greater depth capability, and have enhanced ergonomic features. Consider the external strobe and accessory lens options as critical components in any advanced prosumer system.



For great photos, consider investing in a sophisticated housing.

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Which strobe should you buy?

OF ALL THE digital variables, strobe use seems to create the greatest conundrum. Digital viewfinder cameras determine automatic strobe values by reading a preflash so they know how much light to pump out during the "real" exposure. A conventional slave strobe will likely trigger due to the preflash, and not be recycled quickly enough for the real deal. Fortunately, strobe manufacturers have been quick to pick up on this problem and create diverse solutions. Ikelite, Inon and Sea & Sea are three strobe manufacturers that have been active in this area. Their solutions range from fiber-optic cables that read the in-camera flash and synchronize appropriately to remote slave sensors and strobe circuitry engineered to mimic the camera's



Digital SLR housings offer composition and focus through the lens, plus confirmation of the image on the camera's rear LCD panel.

preflash. Light & Motion has tackled the problem from a different angle and created circuitry in its housing's ROC controller to effectively deal with this

problem. Engineers in all of these companies are making the use of accessory strobes much easier with point-and-shoot digital cameras. It's still a work in

HAVE YOU EVER

said g'day underwater?



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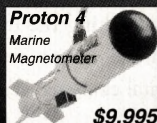
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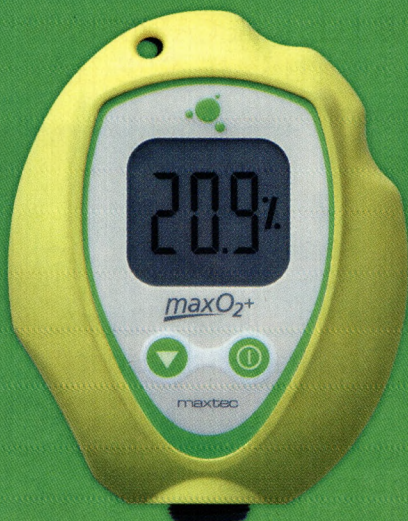
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progress, but impressive advances have already been made.

Follow the Rules

REGARDLESS OF WHICH system you choose to use under water, the rules of underwater photography remain inviolate.

Get close. > The density and color of seawater are enemies to quality underwater imaging.

Find clear water. > Of course this isn't always possible. But clear water is better for reducing backscatter, especially when using a camera's built-in flash.

Use interchangeable optics. > With a viewfinder digital, this will typically mean external optics that can be added while under water, but some housing manufacturers have created ports optimized for screw-mount lenses that must be installed before you get in the water.

Be creative in your use of strobe light. > Good color in underwater photography comes from the proper application of artificial light. Most of the best new digitally enabled strobes offer as many as 10 different power settings, so very subtle effects are possible with the turn of a knob.

Be aware of the importance of ambient light. > Blending strobe and ambient light effectively is critical in making the leap from only recording the moment to creating art. Easy access to the camera's shutter speeds and the strobe's power settings are absolutely necessary.

Capture subjects that are photographically worthy. > A bad photo is still a bad photo, whether it resides as silver halides or pixels. Digital imaging requires the same creative eye and brutal self-critique as does analog capture.

SD

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The diving is as great as the resort, with six custom 42-foot dive boats located adjacent to the spacious gear storage area, an underwater photo center, SSI and PADI courses, hyperbaric chamber and nitrox. More than 50 spectacular sites are nearby, with typically excellent visibility, wonderful wall diving, and abundant fish and coral life. There's also superb shore diving day and night!

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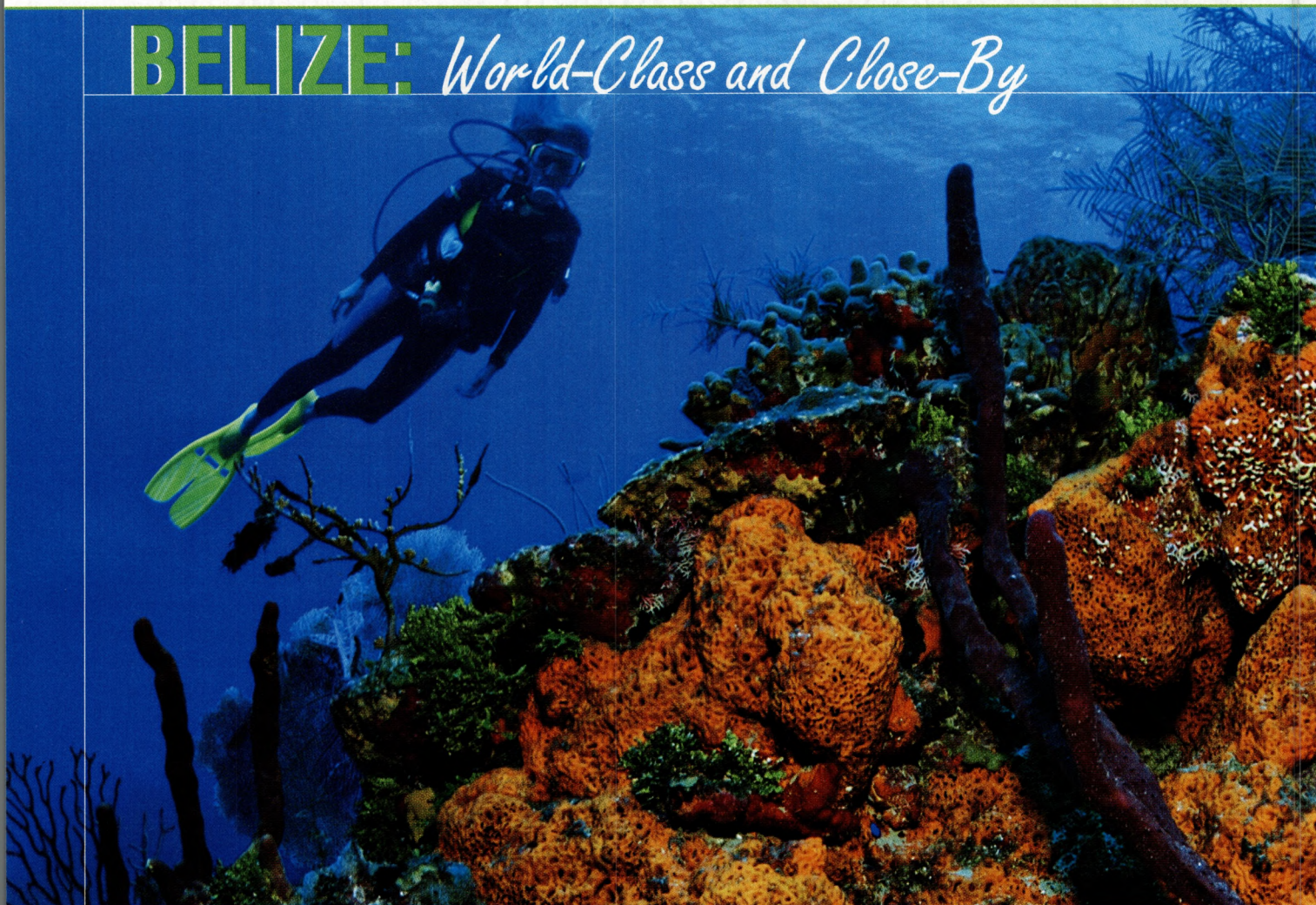
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BELIZE: *World-Class and Close-By*



This spring and summer, if you're looking for an exotic world-class dive vacation without having to circle the globe, take a close look at Belize. This popular destination is just a short two-hour-or-so flight from the continental United States, but is one of the premier diving and snorkeling destinations in the world.

Snuggled between Mexico to the north and Guatemala to the west and south, English-speaking Belize is a land rich in natural beauty below and above the surface. Renowned for its pristine waters, marine life, and lush unspoiled landscapes and wildlife, Belize deserves its nickname of "Mother Nature's Best Kept Secret."

"With the world's second largest barrier reef just off our shores, Belize is known for world-class diving and snorkeling," says Minister of Tourism Mark Espat. "Visitors to our country comment most on the beauty and bounty of our treasured natural resources, as well as the warmth of our people."

As a dive destination, Belize boasts some of the most famous dive sites in the world, including the world's second longest

barrier reef; the Blue Hole, popularized by famous marine biologist Jacques Cousteau; and The Hol Chan Marine Reserve.

Belize is home to a complicated system of individual reefs that parallels the nation's coastline for 185 miles from the Yucatan to Central America. The system features more than 70 types of hard corals, more than 400 species of fish, three magnificent atolls, seven aquatic World Heritage sites, nearly 200 off-shore cays and an endless array of dive sites.

For the more seasoned diver, Belize's famed Blue Hole is a must-see attraction. This near perfectly circular limestone sink-hole runs the length of the Belizean coast, is 1000 feet in diameter and 412 feet deep.

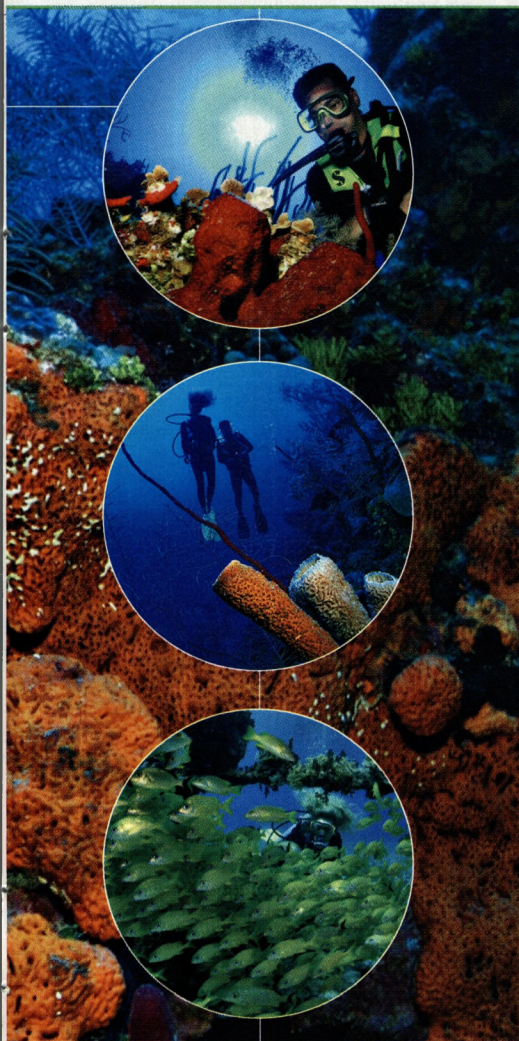
Hol Chan Marine Reserve, right off of Ambergris Caye, is an underwater park

where divers and snorkelers will see some of the most brilliant and abundant marine life and underwater gardens found in Belize or anywhere else.

Veteran divers and newcomers will find clear, cobalt-blue waters with coral reefs, mangrove islands, flooded caverns, steep walls and deep canyons that shelter marine life beyond counting—rays, sharks, turtles, seahorses, grouper, eels, lobster and conch to name a few. At the end of diving, friendly operators return divers to a laid-back Caribbean island atmosphere of sandy streets, comfortable cabanas, thatched-roof restaurants and friendly bars.

The only thing difficult about planning a dive trip to Belize is deciding which dive site to choose. Resorts and dive operators in

BOOK IT!



Belize make this decision easier by offering guests dive package specials that feature a variety of dive attractions and accommodate most budgets.

Just two hours by air from Houston, Belize is a very convenient dive destination. Once there, the diving choices include Ambergris Caye, the Turneffe Islands, Glover's Reef, Lighthouse Reef, the Stann Creek District and Placencia. Each offers a different dive vacation experience, but all generally offer superb visibility, mild currents and a wide variety of protected marine life.

The cayes (pronounced "keys") are a chain of offshore islands that range from small uninhabited isles to large tropical islands complete with outstanding resort facilities. They span about 3,000 square miles of protected water, scattered inside and outside the reef itself.

Belize also has three of the Caribbean's

four atolls—ancient underwater volcanoes rimmed in colorful coral. Each atoll forms a circular coral island with a central lagoon, and houses distinctive ecosystems both within the lagoon and surrounding the atoll. With dramatic underwater walls, channels and canyons, the atolls offer some of Belize's most spectacular and world-famous dives.

At 25 miles in length, Ambergris Caye is the largest island, with the small town of San Pedro serving as a Belizean dive Mecca. Ten minutes away, Hol Chan Marine Park was the first such protected area in Central America. The walls and pelagics are enough to keep visiting divers busy for a week or more, while additional sites and a wide range of resorts keep divers coming back year after year.

To the south, the Turneffe Islands are made up of more than 30 islands and cayes. More than 70 dive sites await exploration, including a 35-mile wall of coral on the west end and interesting dives like the Elbow, where ocean currents meet to form a soup of large marine life there for the free lunch.

West of the Turneffe Islands, the Lighthouse Reef area features the famed Blue Hole. Lighthouse Reef also offers up the Half Moon Caye Natural Monument, home to more than 100 species of birds and like numbers of protected fish species.

Further south, Glover's Reef is quickly growing in popularity, thanks to pristine conditions and diving that can include mantas (generally December to May) and incredible drop-offs. Even further south, quickly-developing dive destinations (and resort areas) include the Stann Creek District of central Belize and Placencia of southern Belize. If you're looking for an even more remote Belize diving experience, these are two great choices.

When not diving, visitors will enjoy some of the most varied topside time of any dive destination in the world. With a lush rainforest interior, there are numerous activity options like hiking, mountain biking, and horseback riding, with destinations including national parks, resorts, private lands and even underground archeological sites.

With spectacular diving and the ultimate in topside adventures and relaxation, you'll never forget your vacation in the world-class and close-by Belize.

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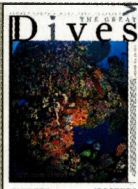
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Note: Subject to change

Depth

1



KUDA BOLI, MALDIVES, P. 17 •

Felidhoo Atoll is nestled in the center of the Maldives archipelago, in the northern tip of the Indian Ocean. **Dive Charters:** *Maleesha Royal Cruiser*, www.seamaldives.com.mv; *Manthiri*, www.manthiri.com.

BONNIE'S ARCH, GRAND CAYMAN, P. 18 • You might have better luck getting close to the tarpon by visiting Bonnie's Arch as a shore dive rather than with a large group from a boat. Find the closest mooring buoy to Bonnie's Arch condominiums and follow a sandy ravine to the site. For a list of Grand Cayman dive operators, plus comprehensive travel guides and more, go to www.scubadiving.com and click on TripFinder.

NORTHERN GREAT BARRIER REEF, AUSTRALIA, P. 20 •

Certain reefs are better for spotting dwarf minke whales, and live-aboard operators know these areas best. For a list of Great Barrier Reef dive operators, plus comprehensive travel guides and more, go to www.scubadiving.com and click on TripFinder.



2



BAY ISLANDS TRAVEL GUIDE, P. 34 • Water Conditions >

Water temperatures are typically in the low 80Fs, but can drop to around 76F in winter. Visibility can reach 100 feet and beyond on good days. **Weather >** Year-round temperatures hover in the mid-80Fs, but may drop to the high 60Fs after a rain. The rainy season runs from October through early January with frequent, brief downpours. **Money Matters >** The Honduran lempira is the official currency, but you'll have no problem shelling out U.S. dollars. Bring enough cash to cover incidentals and to tip the boat crew or hotel staff. The live-aboards will let you charge your gratuities at the end of the cruise. There is a \$25 departure tax, and a \$2 fee for security. **Documents >** U.S. and Canadian citizens must bring a passport, but don't need a visa. **Language >** English is widely spoken, but you may want to take this opportunity to practice your Español. **Time >** Central Time—same as Chicago or Houston. The islands do not observe daylight savings time. **Live-aboards >** *Bay Islands Aggressor IV*, www.aggressor.com. **Tourism >** Bay Islands Tourism, www.bayislandstourism.com. **For More Info >** For detailed information on Bay Islands dive operators, comprehensive travel guides, special dive deals and recent trip reports submitted by users, click on TripFinder at the top of our home page, www.scubadiving.com.

FEATURES

MANUFACTURER Product Name		PRICE	STYLE	MADE IN	WARRANTY	SIZES	BUOYANT LIFT (mfr. claim)	POCKETS W/ CLOSURES	BACKPACK	TANK BANDS	WEIGHT SYSTEM	DITCHABLE WEIGHT	NONDITCHABLE WEIGHT	CARRY HANDLE STRAP	TANK POSITIONING ADDL. REMOTE EXHAUST VALVES	
   	OCEANIC Probe QLR	\$599; \$619 (XXL)	Jacket	China	2 yrs.	7	24-54 lbs.	3 zippered 2 Velcro	hard	1	Mechanical	20 lbs.	10 lbs.	Yes	No	2
	AERIS Atmos XT	\$469.95	Hybrid	China	2-yrs. limited	4	32-48 lbs.	2 zippered	hard	1	Mechanical w/ Velcro	24 lbs.	10 lbs.	Yes	Yes	2
	MARES V1 MRS	\$479	Jacket	Estonia	1 yr.	5	31-52 lbs.	2 zippered	hard	1	Mechanical	26 lbs.	10 lbs.	Yes	No*	2
	DEEPOUTDOORS Matrix	\$824	Back buoyancy	USA	Lifetime	4	55 lbs. 34/85 lbs. optional	optional	soft	2	Velcro	40 lbs.	optional	No	No	1
	TUSA Imprex Pro Cubic	\$550	Back buoyancy	Taiwan	1-yr. limited	3	43 lbs.	2 zippered 1 Velcro	hard	2	Velcro	20 lbs.	10 lbs.	Yes	Yes	3
	SEAQUEST Fusion	\$749	Hybrid	Mexico	Ltd. lifetime	5	35-45 lbs.	1 zippered	hard	1	Mechanical	20 lbs.	10 lbs.	Yes	No*	3
	SHERWOOD SCUBA Outback	\$320	Back buoyancy	Thailand	2-yrs. limited	4	60 lbs.	1 Velcro	semi-hard	2	Mechanical	20-30 lbs.	10 lbs.	No	Yes	1
	DACOR Falcon	\$379	Back buoyancy	Estonia	1 yr.	4	34 lbs.	1 zippered	hard	1	Mechanical w/ Velcro	20 lbs.	8 lbs.	Yes	No*	1
	DUI Delta Wings	\$598	Back buoyancy	USA	3-yrs. limited	1	58 lbs. 35 lbs. available	n/a	soft	2	RipCord	40 lbs.	n/a	No	Yes	1
	INTL. DIVERS Advantage	\$499	Back buoyancy	Mexico	Ltd. lifetime	3	49 lbs. 85 lbs. optional	2 zippered	soft	2	Mechanical	24 lbs.	5 lbs.	No	Yes	2
	OCEAN MASTER Knight Pro	\$609	Back buoyancy	USA	2-yrs. limited	4	45 lbs. 55 lbs. available	1 Velcro	soft	2	Mechanical	20 lbs.	10 lbs.	No	No	1

* Carry handle can be used as a tank positioning strap.

VARIANCES IN BUOYANT LIFT

Between manufacturer's claims and ScubaLab measurements (using size medium BCs).

(+)= Measured buoyant lift is higher than claimed

(-)= Measured buoyant lift is lower than claimed

LESS THAN 10%	11- 20%	21% +
AERIS Atmos XT (-)	DUI Delta Wings (+)	DEEPOUTDOORS Matrix (+)
DACOR Falcon (+)	OCEANIC Probe QLR (-)	MARES V1 MRS (-)
INTL. DIVERS Advantage (-)	SHERWOOD Outback (-)	OCEAN MASTER Knight Pro (-)
SEAQUEST Fusion (+)		
TUSA Imprex Pro Cubic (+)		

NOTE: Due to differences in how BCs are tested for buoyant lift, a 10 percent variance between claimed and measured lift capacities is considered reasonable, and up to a 20 percent variance is not unusual. But a variance greater than 20 percent means the manufacturer is not providing reasonably useful data to divers who need accurate buoyant lift figures to make sure the BC they choose meets their individual diving needs.

INHERENT BUOYANCY

Measured in the water with the BC empty.

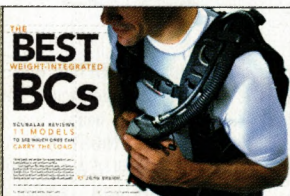
NONE	LESS THAN 1 LB.	1 - 2 LBS.	2 - 3 LBS.	MORE THAN 3 LBS.
DUI Delta Wings	DACOR Falcon	AERIS Atmos XT	TUSA Imprex Pro Cubic	OCEAN MASTER Knight Pro
OCEANIC Probe QLR	MARES V1 MRS	DEEPOUTDOORS Matrix		
INTL. DIVERS Advantage		SHERWOOD Outback		SEAQUEST Fusion

NOTE: Although we would not consider the inherent buoyancy of any of these BCs a matter of concern, every pound of inherent buoyancy is an extra pound you must carry in your ballast system to neutralize it. When it comes to inherent buoyancy, less is always best.

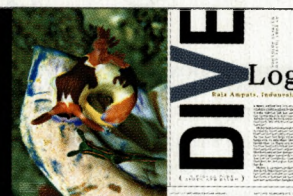
FLOW RATES

MANUFACTURER Product Name	INFLATOR/DEFLATOR HOLD OVERHEAD	CORRUGATED HOSE PULL DUMP VALVE	RIGHT SHOULDER REMOTE VALVE
OCEANIC Probe QLR	Yes	Yes	Yes
AERIS Atmos XT	Yes	Yes	Yes
MARES V1 MRS	Yes	Yes	No
DEEPOUTDOORS Matrix	Yes	No	n/a
TUSA Imprex Pro Cubic	Yes	Yes	Yes
SEAQUEST Fusion	n/a	n/a	Yes
SHERWOOD SCUBA Outback	Yes	Yes	n/a
DACOR Falcon	No	Yes	n/a
DUI Delta Wings	Yes	No	n/a
INTL. DIVERS Advantage	Yes	No	n/a
OCEAN MASTER Knight Pro	Yes	No	n/a

We test flow rates to determine whether a BC's deflation valves will stay ahead of the inflation valve to avoid an out-of-control ascent in the event the inflation valve sticks open. In a heads-up ascent position, starting out with the BC totally empty, the inflation valve was simultaneously activated for 20 seconds with each applicable deflate valve (those located in the shoulder areas, or the highest valve position while in a heads-up ascent position) to determine whether deflation could stay ahead of inflation.



4



ERGONOMIC PERFORMANCE

	ASCENT CONTROL	ATTITUDE & STABILITY	VALVE OPERATION	WEIGHT DITCHING	COMFORT & ADJUSTMENT	ASSEMBLY	WEIGHT LOADING	POCKETS & ATTACHMENT
4	4	4	3	3	4	3	4	
4	4	4	3	3	4	3	4	
4	4	4	3	3	3	3	4	
3	4	3	5	4	3	4	optional	
3	4	4	3	3	3	3	3	
2	4	3	5	4	3	4	3	
3	3	3	4	3	3	2	3	
3	3	4	2	3	4	4	3	
2	3	3	3	4	4	3	n/a	
3	3	3	3	2	3	2	3	
2	3	2	4	3	3	3	3	

RATING SYSTEM

5 = Excellent 4 = Very Good 3 = Good 2 = Fair 1 = Poor

ERGONOMIC CHART EXPLANATIONS

MOST IMPORTANT

Ascent Control An evaluation of how easily the BC can be used to control a normal ascent.

Attitude and Stability Evaluated while swimming under water to determine if the BC will keep the diver in the proper swimming position without wobbling.

MODERATELY IMPORTANT

Valve Operation Evaluated by the ease with which a diver can find and use the oral and power inflators, the oral deflator held overhead, the pull dump and the remote exhaust valve(s).

Weight Ditching An evaluation of how easy or difficult it is to ditch weights in a simulated emergency.

Comfort and Adjustment Checked both in and out of the water with BC strapped to a tank.

CONVENIENCE ITEMS

Assembly Performed on deck without instructions. Although BCs should be supplied with clear and complete instructions, most divers don't take them on the boat.

Weight Loading An evaluation of how easy or difficult it is for a diver to load weights and secure the system while wearing the BC.

Pockets & Attachments Tested in and out of the water, this is an evaluation of how easy or difficult it is to access and use pockets, D-rings, etc.

TESTERS' CHOICES: ScubaLab's Testers' Choices are based on the adjusted scores for ergonomic performance (actual scores X 3 for "Most Important" categories, actual scores X 2 for "Moderately Important" categories, and actual scores X 1 for "Convenience Items"), with additional points awarded for lack of inherent buoyancy and valve performance.

DIVE LOG: RAJA AMPAT ISLANDS, INDONESIA, P. 60 • Dive Conditions and Climate > The best season for diving the Raja Ampats is November through March when water temps are in the high 70s to low 80s. The air is always warm and humid as you are within one to two degrees of the equator. **Getting There** > From the U.S., most people fly to Bali, but you can also transit through Jakarta. Sorong is about a three-hour flight from either airport. There are several ways to connect through local carriers. **Live-aboards** > Kararu Dive Voyages, www.kararu.com; Grand Komodo Tours, www.komodoalordive.com; MV Pindito, www.pindito.com. **Land-based Dive Operator** > Papua Diving, www.iriandiving.com.

5



DRIVE & DIVE: SO CAL, P. 41

REFUGIO STATE BEACH > From Santa Barbara, travel north on U.S. 101 about 25 miles to Refugio State Beach turnoff. Cross under the railroad tracks and turn right. Camping is \$16 per night and day-use parking is \$6. For camping reservations (recommended), call (800) 444-7275. **CASINO POINT UNDERWATER PARK** > From Los Angeles, travel south on Interstate 710 (Long Beach Freeway) to Golden Shore, right at stop sign to Catalina Express Terminal. Park in structure to the left (\$9). Round-trip fare to Avalon is about \$43, but rates and schedules vary with the season. Departures are also possible from San Pedro and Dana Point. Call Catalina Express at (310) 519-1212. At Avalon, gear rentals, cart rentals and air fills are available from Catalina Divers Supply on the green pier. Call (310) 510-0330. Tank rental is \$10, weights, \$15, and air fill at the pier or Casino, \$5. There is no charge for diving the underwater park. **POINT LOBOS STATE RESERVE** > From Carmel, travel four miles south on Highway 1. Dive reservation is \$7 per buddy team of two; parking is \$5. Call (631) 624-8413 for conditions report and reservations, or go to www.ptlobos.org. **SHAW'S COVE** > Take Highway 1 to Fairview Street in Laguna Beach. Turn north (toward the ocean) to Cliff Drive where Fairview dead-ends, and park wherever you can (you'll be ticketed if you park in a no-parking zone). The path to the stairs to the public beach is at the end of Fairview. There is no charge to dive here.

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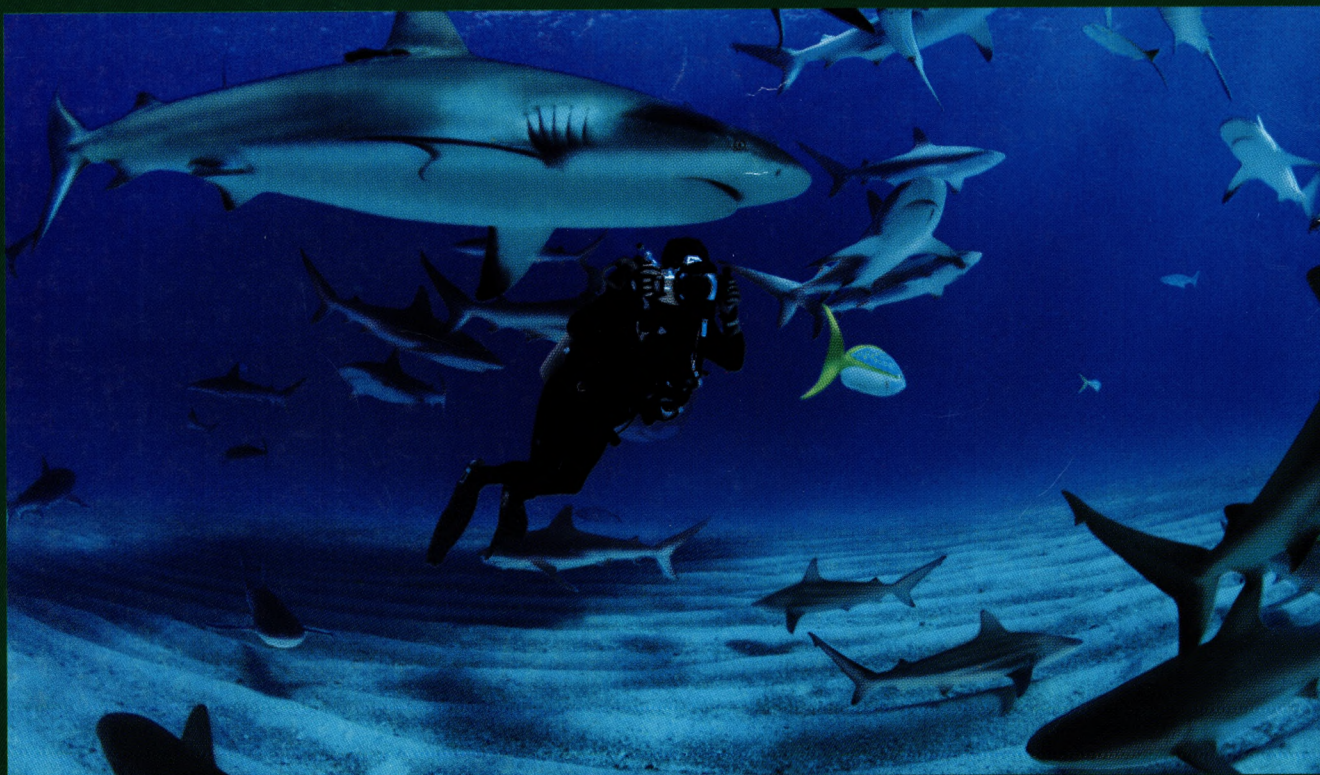


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